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This issue of "Training for Progress," a bulletin published four times annually to provide for an international exchange of experience in vocational training, surveys the principal lines of thought and action in vocational education as seen through "CIRF Abstracts." An introductory editorial describes the development of "CIRF Abstracts" from its emergence in 1961 as a comprehensive guide to the training of workers, supervisors and training staff, technicians, and other skilled personnel, to its present broadened geographical scope which aims at world-wide coverage and its broadened technical scope which recognizes the social and economic context of vocational training. Limitations, such as the lack of documentation of activities in developing countries, are acknowledged and two tasks of "CIRF Abstracts" in modern documentation work are identified: to provide a systematic basis for research and to help specialists broaden their views and open new horizons to them. The following chapter headings are indicative of the development described: (1) "Economic, Social, and Technical Aspects," (2) "Systems and Organizations of Education and Training," (3) "Vocational Orientation, Guidance and Selection, (4) "Supervisors and Technicians," (5) "Teaching and Instructing Staff," (6) "Training Methods and Teaching Aids." A bibliography of 539 abstracts discussed in the text is included. (JK)

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Training for Progress

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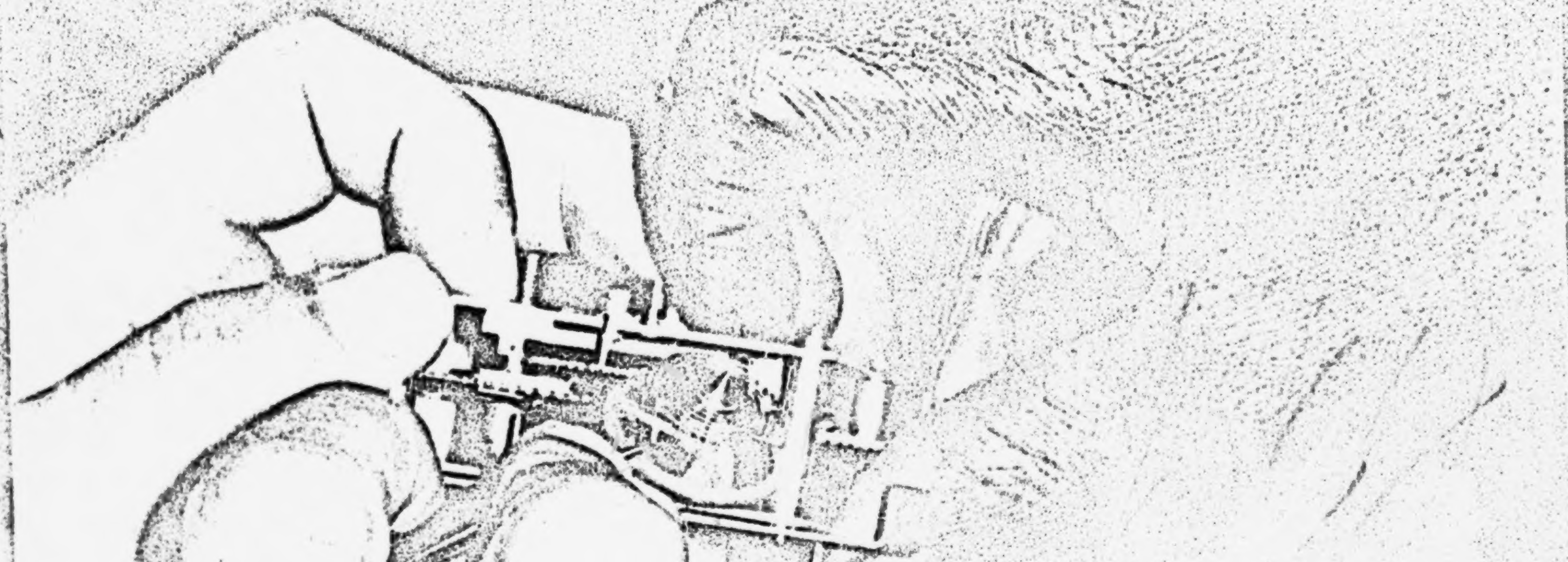

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Editorial

Trends in training

This issue of "Training for Progress" may be criticised for attempting to do the impossible. Its purpose has been to bring together the principal lines of thought and action over the past six years in the wide field of vocational training and education, as seen through the material published in "CIRF Abstracts". The 1960s have perhaps been particularly fast moving in this field. We have wanted to assemble and bring the reader what we have observed in the course of our documentation work, and at the same time to check whether the abstracts service is truthfully and fairly reporting the major trends and developments.

We believe that the 112 pages of this issue provide interesting reading for education and training specialists, for organisers and administrators of training programmes and for manpower planners the world over. We hope it will suggest new lines of action and research in what is an increasingly vital and complex field.

CIRF Abstracts, 1961-1967

A constantly updated reference source on vocational training and education, a comprehensive and readily accessible guide to what is going on in the world in the training of workers, supervisors and training staff, technicians and other skilled personnel in all fields of economic activity: that was what we had in mind when the first volume of "CIRF Abstracts" was launched towards the end of 1961. Some 18 months later we made a first assessment of the current and possible future coverage of the newly established service.

On the basis of an extensive sampling we concluded that more than 20,000 items—laws, regulations, books, research reports, idea articles and descriptive notes on successful or particularly interesting pilot experiments—would have to be catalogued each year if we were to cover the whole range of questions in reasonably adequate fashion. And even so, we knew that this figure excluded a number of categories of documentation and materials which some people would undoubtedly like to have covered. We did not include, for instance, text-books, job or trade descriptions, training syllabi, correspondence courses, teaching aids, tests and other materials used in vocational guidance, training and skill testing. Had we done so, the over 20,000-item list would certainly have more than doubled. Had we gone further, and attempted to extend the abstracts coverage to include, in addition, the many thousand occasional papers and conference documents, and the speeches, interviews and other items reported in the daily press, the flow would have got completely out of hand.

This sampling and these calculations formed part of a project in 1963 to review the editorial policy and selection criteria applied in producing each volume of "CIRF Abstracts". Over the six years which have passed since the early planning stage of the service, and more particularly during the past 3-4 years, the abstracts have changed in many respects. Are they achieving their objective? Certainly their geographical scope has been widened. Originally "CIRF Abstracts" had a strongly European bias, to take account of the special requirements of the Council of Europe and the ILO's other partners in the service, the European Economic Community, the European Coal and Steel Community and the then Organisation for European Economic Co-operation (now the Organisation for Economic Co-operation and Development). From 1964 on, the abstracts have worked towards a world-wide coverage and today include summaries of documents published in or about most countries of the world.

Their technical scope has also been enlarged. From applying a relatively narrow concept of vocational training during the first year of operation, we have gradually extended the coverage to include major trends and research in the far wider field implied by the currently popular term "human resources development". This gradual change is representative of what is probably by far the most important developmental trend in the vocational training field in the 1960s. It is no longer possible to examine vocational training per se. It must be seen in its social and economic context.

In thus extending the technical scope of the "CIRF Abstracts", our editorial policy has therefore merely recognised a current and common need. Future economic development, whatever the country, depends on the stock of skilled manpower available to put technologies into practice, to carry out practical technical work at high quality level. And social advancement is itself dependent on economic growth.

Six broad sectors

It is this broadening of the geographical and the technical scope of the abstracts which has made the present survey both more difficult and more interesting. Quite obviously, the interests and preoccupations of countries, organisations and firms will vary with the level of the economic and social development of the country concerned. This is clearly borne out in each of the six chapters making up this issue.

We have dealt first with the **social, economic and technical background** against which the individual developments, trends and tendencies must be viewed. Population trends, economic development plans, the theories and applications of manpower forecasting and planning, the social aspirations of the people of a country—young and adult, rural and urban—weave individual patterns in education and training and affect both. Also touched on in this chapter is the complex problem, which is just beginning to gain prominence, of determining goals and assigning priorities in national plans. In this chapter, too, are to be found the underlying principles and policies guiding action to solve the problems of out-of-school, out-of-work youth, of retraining older workers and workers displaced by technical change, of integrating the physically and otherwise handicapped worker into the active labour force, of looking after the needs of the socially and economically disadvantaged groups of society.

Chapter II gives the highlights in the changes which have occurred, or are under discussion, in the **national systems and organisational structures of education and training.** What are the changes in concepts of education? How long are children staying on at school? How should the school prepare them for their entry into the world of work? When should they start real vocational training? What are the relative merits and demerits of school-based training and training organised within the undertaking? What arrangements are made, if any, for ensuring the worker's permanent access to further training and education, in the interests of the individual and of national social and economic progress?

By discussing the recent educational reform movements in France, Poland, the USSR and Sweden, for instance, it is possible to acquire an insight into the implications of the prolongation of compulsory schooling, the polytechnical concept of education and the integrated approach to education. The controversies over the responsibility for training are clearly visible in the legislative action taken, or under discussion in the United Kingdom, the Federal Republic of Germany and Italy, and in practically all the developing countries over the past ten years or so. But the latter countries are also under numerous pressures which deserve and have been given special attention in this and in the other chapters.

Closely linked to the changes in the organisation and content of education and training, **vocational guidance** has gained new importance in the over-all pattern during the past few years. It is a sector which has not perhaps been paid enough attention in the past, but which is likely to expand and develop along new lines in the next decade or so. Chapter III attempts to outline some of the recent developments in this field and to sketch some of the research lines of the future.

Separate chapters have been devoted to trends and developments in the training of **supervisors and technicians** and the equally vital sector of **teaching and instructing staff** for vocational schools and industry-based training programmes. These are the staff of whom, in the final analysis, technical development and economic progress stand most in need. Without instructors to train the rising generations, without technicians to translate the engineer's plans into practical action, without supervisors to implement, with the workers, the decisions and objectives of middle-level and higher management, economic growth will remain an objective impossible to achieve. Why then, when all recognise the importance of these categories of personnel in the economic structure of the country, are they so chronically in short supply? What is being done to speed up or to improve the training process? To what extent have some of the training programmes, often being tried out on an experimental basis, been successful? Where have they met snags? Chapters IV and V have tried to give an over-all view of these two critical fields, to describe some of the long-term reorganisation plans and the short-term measures to meet specific needs and situations.

The final chapter of this survey deals with **training methods and teaching aids,** It is a chapter of experiment and research, indicative of the new approaches being applied in attempts to solve some of the problems and situations discussed in the earlier chapters. New techniques and new needs give rise to new training requirements and to a spirit of experimentation. This is clearly shown up in the abstracts. What is also shown just as clearly is the tendency for the dividing line between theoretical and practical instruction to become blurred. Simulation techniques in training are tending to bring the workshop right into the classroom, while research into the potential of the computer to store and dispense information at need seems likely to bring theoretical instruction within the reach of the man on the job.

CIRF Abstracts, 1968—

Of course, there are topics and events which have been left out, or have been mentioned only in passing. Given the space at our disposal in this issue and our documentation basis, and accepting the need to cover a field which is geographically and technically so extensive, a survey such as this cannot lay claim to being exhaustive.

Some of the shortcomings we are already only too aware of. We have set a standard which sometimes is difficult to live up to: we want to report direct from the original source, not merely to reproduce data from secondary sources whose validity and value we are unable to check. We know that, as a result, our coverage of material published in Chinese, Japanese and other languages of Asia and the Far East needs improving.

The relative value of sources of information is one of our major documentation difficulties. This is not a mere matter of language, however. The volume and quality of written material in our fields of interest vary tremendously from one country to another. The numerous specialised journals published in most countries of Europe and North America often have no counterpart in other regions of the world. In the developing countries, there is little published material which can serve as a basis for an abstract. Yet, contrary to what is frequently suggested or believed, the developing countries are today those in which some of the most advanced and important innovations and developments in training are taking place. In almost every one of these countries new methods of training are being tried out, new training materials are being developed, experimental programmes and pilot projects are being successfully applied.

We know, for instance, of much valuable work being done by UNESCO and by national governments in the field of fundamental education or work-oriented literacy programmes. But our sources of information have yielded little published material on it which can be used for the abstracts service. We are also aware of the tremendous volume of informal training being done in small shops, not only in the developing countries but elsewhere as well. In most instances, this type of in-service training is the only training which the vast majority of workers in the developing countries ever receive. But once again, this is a topic which is rarely discussed in training journals and other printed material suitable for abstracting.

The manpower and economic planners are fully conscious that the creation of employment opportunities is just as important for the underdeveloped or disadvantaged areas of the world as the provision of training programmes and facilities. Without the former the impact of the training programmes will be rendered void. Yet this is a problem which is only touched on here and there in training and manpower development documentation.

In view of the urgent need for supervisors in the developing countries, remarkably little mention is made of the need and the way to create the necessary nucleus of supervisory staff in these countries. The shortage of technicians is cried from the rooftops, but the lack of indigenous supervisory staff is virtually passed over in silence.

Nevertheless, much is being done to train foremen and others in supervisory functions. There are, for instance, many cases of training being organised jointly for supervisors and vocational instructors, both in their instructing functions and for general upgrading purposes.

What, under certain circumstances, should be the content of training programmes and syllabi? What should be done to encourage girls to enter fields of technical and vocational training which in the past have been exclusively reserved for boys? Our information is sporadic, at best.

These are all topics and aspects on which more information is needed, to which more attention should be given by the planner, the educator and the research worker. To them should perhaps be added another: the need to reconsider the objectives of education and training. Goals research is a relatively new field. Applied to education and training it presents countries with the dilemma of allocating scarce resources, of sometimes choosing between quality and quantity, perhaps of readjusting sights and trying to find an appropriate solution to the problem.

There is no one answer to any of these questions. The field for research is wide open. We hope that in the next few years they will be dealt with more extensively in training journals and other documentation, so that new and original material on them can be included in future volumes of " CIRF Abstracts."

Modern documentation work in vocational training—and we believe that the " CIRF Abstracts " are an example of how it may be done—has two tasks. There is the task of providing a systematic basis for research on vocational training and related subjects. There is the educational task of helping the specialists broaden their views and of opening new horizons to them.

What we have tried to do in this issue is to outline the trends of development in order to show where are today's horizons in the vocational training field.

SVEN GRABE

I. Economic, social and technical aspects

The back-drop against which the trends and developments of the 1960s in the fields of education and training must be viewed is composed of a number of social, economic and technical factors interwoven in an infinite variety of complex patterns. Even within a given country, let alone within a continent or a specific group of countries, there is rarely a single, dominant theme. Moreover, it is sometimes extremely difficult to say whether a particular development has been prompted chiefly by an economic or by a social motive.

Was it principally concern for the plight of the individual under-educated, under-employed unskilled worker in Southern Italy which led the Cassa per il Mezzogiorno to develop a prevocational programme, whose cost runs into millions of lire, for the 11-to-14-year olds in the Calabrian peninsula (1), or was it recognition of the waste their situation represents to the economy of the region and the country as a whole?

Action on behalf of socially or economically disadvantaged populations—the Esquimaux living in scattered settlements in the outer Northern Territories of Canada (2), the indigenous population of Papua and New Guinea (3), the Australian aborigines in New South Wales, Western Australia and the Northern Territory (4, 5), the inhabitants of remote mountain villages in Switzerland (6) as well as the crucial Negro and other minority groups in the USA (7)—must inevitably be put down to both social and economic motivations.

National endeavours to integrate physically handicapped workers into the active labour force may have been prompted by recognition that treatment as a normal part of the workforce is the best possible therapy for the disabled person himself. They may equally as well be the result of concern over the loss of his potential skills to the economy and over the financial burden of keeping him in a service establishment if the latter course of action is not strictly necessary because of the gravity of his disability.

The demand for, and the newly reinforced drive to provide more and better education and training are indicative as much of a spontaneous movement for the acquisition of the skills and knowledge which will help the individual to advance along the social scale, as of a desire to equip him to make a better contribution to the economy and to society as a whole.

The two aspects are inextricably mingled. And through them both runs a third factor: the exceedingly rapid evolution of technical change over the past two decades.

Common themes and trends

Despite this extreme variety in events and the complexity of the patterns, however, it is nevertheless possible to distinguish two ideas which seem to act as common denominators in the vocational training field. There is first of all recognition that vocational training is dealing with people—people of all ages and all walks of life. As such, one of its main objectives must be to achieve, to the greatest extent possible, the personal development and satisfaction of the individual. Secondly, there is recognition that vocational training is one—but only one—of the tools for economic growth. Used properly, it can help to promote both the prosperity of the nation and the fulfilment of the social aspirations of the individual.

The variety in national economic and social structures, and the complex national heritage of the individual countries preclude any but the very broadest conclusions as regards trends and tendencies in the field of education and training. It is perhaps safe to say only that there is a new and general awareness of the complexity of the interactions of social and economic policies and levels of industrial development, a growing awareness of public responsibility in this field and, at the same time, recognition of the need for a global approach, for comprehensive planning if some of the problems raised are to be solved.

These three elements have had the effect of forcing vocational training out of its previous isolation. It is no longer the preserve of the educationists and vocational training specialists. It is more and more being consistently included in the sphere of economic and social planning.

Populations and policies

One of the main problems in attempting to determine trends on a world-wide basis is, of course, that countries and peoples have developed, and always will develop at different rates. They experience the same phenomena but at different stages in time. At any one period, therefore, it is possible to see different and often diametrically opposed trends and tendencies.

" Population explosion " is an expression which is in frequent use. A report prepared by SENAC, the Brazilian National Commercial Apprenticeship Service, in 1964 for a conference on the demographic situation and on socio-economic factors affecting employment and vocational training policies in Latin America, pointed out that the population of Brazil was expected to have risen from some 75.3 million in 1962 to 116.3 million by 1975—a more than 50% increase (8). According to figures prepared two years later for a conference of Ministers of Education and Ministers responsible for Economic Planning in Latin America (sponsored jointly by UNESCO and the UN Economic Commission for Latin America), the population of the whole region will have shown a 65% increase between 1965 and 1980, a period of only 15 years (9). The same type of statistics could be gathered for Africa and for virtually all the countries of Asia.

Allowing for a reasonable margin of error for lack of, on the one hand adequate machinery for collecting population statistics in these countries, and on the other reliable data for use as base year, it is still clear that the major concern of these countries as regards their education, training and employment policies will be quite different to the preoccupations of countries which have experienced contrary demographic trends. Between 1953 and 1963, for instance, the working population of the United Kingdom increased faster than the total population increase (0.7% and 0.6% increases per annum respectively), but over the next 10-year period the trend will be reversed: an 0.4% labour force increase compared to an 0.6% rise in population (10). This is fairly typical of most of the countries of Europe: what was known as the " battle of the bulge " is over; the impact of the new rise in the birth-rate will not be felt for some years to come.

In much, perhaps over, simplified terms, therefore, there are two groups of countries. One group comprises countries struggling with a population growth which surpasses all possibility to feed adequately, let alone to educate the individual and provide him with gainful and useful employment—countries with a vast majority of their population under 25 years of age and coming from a largely rural background. The second group consists of those with a low average rate of population increase, and with an ageing and largely urban population. But even here there is no hard and fast rule. India and Brazil, like most other developing countries in which vast industrial cities have grown up over the span of a generation or two, logically belong to the first group, but are faced with all the problems of the large urban agglomerations and the drift away from the land. Italy and the USA, both highly industrialised and economically developed, at the same time have to deal with pockets or regions of under-development with low-income and inadequately trained and educated segments of the population.

To meet these several situations, parallel lines of action have developed. The dominant theme is that of ensuring that all segments of the labour force contribute to the fullest possible extent to the economic expansion of the community and country concerned. This is a common objective. The means for achieving it vary. In labour shortage areas and economies, efforts tend to be directed towards expanding the active labour force by recuperating and reintegrating in it categories of personnel whose productive capacity would otherwise be lost. In labour surplus areas there is likely to be a two-pronged approach to create employment opportunities and at the same time to increase the individual's capacity to produce—i.e. to combat under-employment.

But even so there are inevitably going to be manpower shortages and surpluses side by side. There is no country which does not deplore a shortage of technical staff of varying types and levels, yet in many countries unemployment is relatively high among persons who have achieved a certain level of education (usually junior secondary level) but have not acquired at the same time more specialised and marketable skills. Despite expectations to the contrary, shortages exist with respect to certain categories of manual worker. There is still ample incentive to emigrate, but all too often the emigrant is of a calibre which could be useful to his country of origin; his withdrawal from the home labour force frequently leaves a gap which needs to be filled. There is therefore a need both to stimulate and redistribute employment and to put the workers in a position—that is, give them the requisite skills—to take advantage of the employment opportunities made available.

This survey is more particularly concerned with the latter aspect. But, as already indicated above, education and training policies and trends can no longer be studied separately. They must be examined in conjunction with the economic, social and political backgrounds of which they are a part.

Manpower forecasting and planning

Assessment of existing training facilities and their ability to do the job required of them is increasingly being based on systematic manpower surveys and forecasts of occupational trends and skill requirements, the latter being established in the light of economic development plans. Seen through the abstracts this tendency has achieved a very marked crescendo over the past six years. It was barely touched on in volume 1. In an abstract on France, manpower forecasting was qualified as unsatisfactory because based on a statistical system which was irregular and generally inadequate (11); in another, from the USSR this time, it was mentioned as a field for research (12); in a third case it was merely implicit as one of the elements to be taken into consideration in determining training syllabi for the anticipated greatly accelerated demand in the USA for lower-level staff in operative and service occupations (13). By 1967, with the sixth volume, the discussion presented through the abstracts has attained almost disproportionate importance in relation to both the space at our disposal and the other aspects which need to be covered.

A conclusion of imbalance would not, however, be entirely justified. The growing volume of abstracts on manpower and educational planning is also indicative of the importance which is now being given to this field of activity. As stated in one of the reports considered at the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas (UNCSAT, Geneva, 1962), manpower assessment and planning and the planning of education and training—in other words " investment in human capital " or " human resources development "—have become the focus of discussion (14).

The abstracts on this broad subject tend to fall into two categories. There are those which are concerned with theories and methodologies of assessment, and those which recount the conclusions reached with the application of one or other of the methods to a given country, area, occupational field, etc. The abstract on the UNCSAT report just referred to, and one on another paper submitted to the same conference, are two of the earliest in the human resources development series and usefully provide some of the basic principles and concepts as regards objectives and methods (14, 15).

> " The planning of education, training and employment on the basis of manpower assessment techniques must be integrated with economic planning.
>
> " Manpower assessment aims at measuring the supply of manpower and the capacity of the educational and training facilities, at translating the objectives of the development plan into terms of manpower requirements and, by confronting these data, at working out an education, training and employment programme.
>
> " Education and training are a lengthy process. The general direction of economic development should therefore be determined at the outset. Subsequent policy changes will entail lengthy and costly reorganisation of the manpower development structure.
>
> " Manpower planning must enhance all skill levels and must be continuously adapted to changing requirements...

> "To meet the immediate needs for skilled manpower, accelerated training techniques evolved in the economically advanced countries should be used. The long-term training programme should provide broader basic training... In the early stages it should concentrate on the training of instructors.
>
> "Since industry is little developed in the economically less advanced countries, the governments will have to take over the main responsibility for skill training and create sufficient training institutions...
>
> "Management training has high priority... Sound management may help close the economic gap between developing and advanced countries."

As regards the actual procedures to be followed, one of the papers noted seemingly general agreement that estimates of future manpower requirements must be expressed in terms of educational and/or training categories. It may be necessary to arrive at such estimates via estimates in terms of first industrial sectors and then occupational groups. They should be made within an accounting frame comprising the whole labour force, thus guaranteeing mutual consistency between the different estimates. Isolated estimates, however, are still most commonly made for special categories (e.g. scientists, doctors). The paper went on to indicate the four basic approaches to estimating manpower requirements:

(1) trend projection or extrapolation—the most commonly used method;
(2) international analogies and comparison—but a mechanical application of the theory may be misleading;
(3) direct estimates (from employers or experts) of future manpower requirements—but these run the risk of overestimating short-term changes and underestimating long-term ones;
(4) analytical studies, or basic research on the factors causing changes in the occupational structure of an industry or in productivity—an approach mainly useful for supplementing other methods.

Since publication of these two abstracts, the advantages and disadvantages of the different theories and approaches have been discussed from many viewpoints. The following is a short list of some of the more interesting studies reported in the abstracts:

— Hollister, writing in the "International Labour Review", on the economics of manpower forecasting (16);
— Döös, in his paper on integration of manpower and educational planning into over-all development planning, prepared for the African Institute for Economic Development and Planning (17);
— Tinbergen and Bos, writing for OECD (Organisation for Economic Co-operation and Development) in 1965 on "a planning model for the educational requirements of economic development" (18)—and the country studies applying the model to Greece (19), Spain (20) and Turkey (21);
— Grais, writing for OECD a year later, on methods of forecasting the active population by occupation and level of skill (22);
— Zymelman's paper on skill requirements in manufacturing industries, prepared in 1966 for the United Nations Committee for Industrial Development (UNCID) (23);
— Layard and Saigal's research report on educational and occupational characteristics of manpower—an international comparison study based on data from more than 100 countries (24);

— Horowitz, Zymelman and Herrnstadt, writing on another research study on the international comparisons approach (25).

A recent offshoot of the discussion is the aspect of making an " optimum choice between general and vocational education ", with the theory put forward by Correa in " Kyklos " early in 1965 contested on various points by Corazzini and Bartell, in the same journal, at the end of the year (26, 27).

Goals and priorities

Differences in demographic structure and in historical backgrounds result in different emphases being given to particular aspects of education and training. Because of the expansion in both population and primary education facilities in Africa, the rate at which young people are leaving school is rising much faster than the rate at which opportunities for initial " trainee jobs " leading to rewarding employment are expanding. Government services have a low rate of absorption. New industry is highly capital-intensive and expansion is slow in relation to the hopes and demands of job applicants. The secondary effects of the establishment of large industries—especially through spontaneous entrepreneurship—will not be felt for another decade (28).

For these and for all countries, an element of choice enters the picture, or a series of choices in varying combinations. Given a limited portion of national income available for expenditure on education and training, what proportion should be spent on primary, secondary and higher education, on general education in relation to vocational and technical education, on basic training for youth and on further education and training for adults, on agricultural education and training in rural areas and on training in industrial and commercial skills for urban populations? What percentage of the population should be encouraged to go into higher, university level education, and in what academic fields of study? These are questions for which there is no one answer. They are also points on which the social and economic aspects of education and training tend to become blurred or to merge.

As stated in an Australian article on the problems posed by rapid economic, social and political change in developing countries, educational planning is both more important and more difficult than ever before. The choices nearly always lie between equally desirable alternatives. Priorities have to be established between quality and quantity. In the educational quality concept, a distinction has to be made between the actual quality achieved by a given school system or programme and the appropriateness of the system or programme for the recognised needs of the country (29).

On the theoretical plane this " fitness " aspect of the quality of education and training links up with the relatively new concept of goals research as a method for determining priorities in national objectives. Goals research got its start in the USA in the late 1950s with the establishment of President Eisenhower's Commission on National Goals. More recently the US National Planning Association's Center for Priority Analysis was set up to attempt to establish the interrelationships among recognised national and individual goals—education, health, research, etc. Once the goals have been distinguished cost estimates can be calculated for their achievement and, by setting the latter against the assumed GNP, it is possible to estimate the deficit in GNP for the goals and to establish balanced priorities which will be within national means.

In his book " Goals, priorities and dollars ", Lecht points out some of the interesting features of this new field of research but also some of the difficulties inherent in the approach (30). National goals change: neither the US space programme nor manpower retraining would have been in a list of national goals had one been established in the USA for the 1950s.

Emphases change, too. Of 16 goals defined by the Center for Priority Analysis in 1962, for instance, health and education occupied 7th and 8th place respectively; they are expected to have moved up to 5th and 6th place by 1975. National defence, 2nd in 1962, is expected to drop to 8th place, despite continued expansion of defence capabilities. Manpower retraining will have advanced from 16th place to 15th, but since expenditure on this item in 1962 was extremely low because the programme itself was in its infancy, the actual percentage increase (2,750%) is highest of all the items assessed. Accepting 1% of the labour force as a reasonable standard for the rate in 1970-1975 of those receiving retraining would mean a retraining effort touching between 800,000 and 900,000 persons each year. Such massive retraining, to be successful, implies adequate training allowances, considerable investment in equipment and larger expenditures for research on teaching methods, motivation techniques, programme and curricula adaptation, etc. But it also constitutes an alternative to relieving poverty and joblessness through public welfare assistance and unemployment compensation.

Action trends

Popular demand for education, and the principle of freedom of choice of education, have resulted in imbalances in educational output which have serious repercussions on economic growth. Applying the comprehensive, human resources development approach to planning education and training entails both an over-all development of facilities and programmes to meet estimated future needs and also remedial action. The first line of action is dealt with in chapter II of this survey, which discusses trends in the evolution of national systems of education and training. The main features of the remedial action are discussed below. In effect it consists of two approaches:

(1) measures to recuperate out-of-school youth and to channel them into some kind of training and/or further education which will give them a better chance of gainful employment and social advancement;

(2) provision of retraining and further training for adults whose initial qualifications—whatever their level—no longer suffice for suitable employment and who are likely to become, or have already become, a charge on society.

Out-of-school youth

The situation of young people in a technically advanced society who leave school prematurely is typified in the US President's message introducing a new programme for education in January 1963 and the "Special Labor Force Report: Out-of-school Youth, February 1963" which was released some 18 months later (31, 32). Of 6.7 million young people 16 to 21 years of age in February 1963, 45% had dropped out of school before completing secondary education, 48% had completed secondary school and 7% had done post-secondary studies for 1 to 3 years. Of the 3 million who had no secondary school diploma, 1.5 million had left in the 2nd or 3rd year at the minimum school leaving age, and 750,000 had not got into secondary school at all.

The term " dropout " came into prominence—and into the CIRF vocabulary—at about this time and has since become accepted or adapted into languages other than English. The proportion of unemployed persons under 24 years of age was cause for alarm, and nearly half of them had dropped out of secondary school prematurely. But at least 70% of the dropouts had normal, or better than normal intelligence (33). They left school from boredom, for economic reasons, for lack of timely encouragement. These are the young people that national educational policies are trying to recuperate.

The differences between the US situation and the position prevailing in other countries tend to be but differences of scale. The various solutions to the problem being tried out are much the same, whatever the country: educational programmes better adapted to present day conditions; more systematic vocational orientation and guidance; measures to remove the economic obstacles to training. To eliminate the economic problem France, for instance, has liberalised the system of family allowances to cover children taking recognised part-time courses of related instruction (34). In Belgium a decree issued in 1963 instituted a system of allowances or grants for young persons (16 to 25 years of age) taking courses to improve their intellectual and social education (35). The allowances provided for in vocational training legislation in Canada and the USA have been progressively extended to cover participation in courses and programmes other than those which are strictly concerned with the acquisition of trade skills. One of the main innovations in the 1965 amendments to the US Manpower Development and Training Act (MDTA) was the prolongation of the maximum period for which training allowances were payable, so that persons with a severely deficient educational background could receive a more adequate combination of basic education and occupational training.

The proportion of young persons (16 to 22 years of age) eligible for MDTA allowances was limited, however (36). This is a trend which can be observed in other countries, too. It is less and less common for young people who have left school to be allowed to drift into unskilled employment until they are eligible for stop-gap, short-term training principally intended for retraining or upgrading adults. Instead, they are increasingly being rerouted into comprehensive training and educational programmes which will give them a basis for their further development and training later on. In the USA the main legislative action embodying these principles is the Vocational Education Act of 1963. Among other measures, this Act instituted a comprehensive system of grants, allowances and programmes to provide vocational education for persons (a) attending secondary school, (b) who have completed or left secondary school, (c) who need retraining to achieve stability or advancement in employment, (d) who have academic, socio-economic or other handicaps hindering their success in a regular vocational education programme (37). Another line of attack on the jobless out-of-school-youth problem in the USA has been the establishment of the Youth Conservation Corps to provide useful work experience opportunities for unemployed youth and at the same time to accelerate federal programmes for land conservation and for developing the country's natural resources and recreational activities (38).

In the developing countries action tends to concentrate on expansion of all youth training facilities, somewhat on the basis that some education—any education—is better than none at all. There are also examples of community service programmes which have a triple purpose: continuing the basic education of persons with no further possibilities of education open to them; the development of backward areas; a stemming of the rural exodus. Examples of such action are the Civic Service instituted as an alternative to military service in Mali (39), the volunteer farm projects schemes in Dahomey (40) and Nigeria (41) and the Young Pioneers Movement in the Central African Republic (42). The latter movement and the Mali Civic Service, are in principle compulsory but in practice voluntary: the number of applicants exceeds the programme's capacity to accept and train and educate the young people. The cost of the task is too great for the means available.

The problem of the out-of-school youth of these countries and of the countries of Asia and Latin America, is likely to be the number 1 problem for the next generation or two.

Retraining

Programmes for the retraining of workers whose skills have become, or are likely to become obsolete because of technical change have come in for considerable discussion over the past few years, for both their economic and their social consequences. From the abstracts there seems almost to be a national progression through fairly distinct phases. There have been articles describing the particular problems and solutions attempted in a given branch of economic activity: the automation crisis in the mining and chemical industries in the Federal Republic of Germany (43, 44), the manpower implications of technological change in the off-shore maritime industry in the USA (45) and the merchant navy of the United Kingdom (46), in the rolling mills of the Common Market countries (47), the building industry in the USSR (48), the metalworking and mechanical engineering industries in France (49), and the pulpwood logging industry in Canada (50); and the multitudinous effects of automation, and in particular of electronic data processing (EDP), in manufacturing as well as in the services sector, e.g. the survey carried out in 1963 by the Canadian Department of Labour (51).

There is the phase when plant-level or even industry-level research and action has to be supplemented by national action. Some obvious examples belonging to this phase are the US Manpower Development and Training Act and its subsequent amendments (36, 52), the reinforcing of the Canadian Technical and Vocational Training Assistance Act (53) and its replacement in 1967 by the Adult Occupational Training Act (54), the creation of the French National Employment Foundation in 1963, with powers to award retraining allowances to help wage earners in industry and commerce to retain their earning capacity and combat unemployment induced by technological change (55), the financial assistance programme launched by the Ministry of Labour in the Federal Republic of Germany in 1962 to encourage workers to participate in further training courses for upgrading or promotion (56-58).

Assessment of efficacy

The third phase is the assessment of the retraining programmes launched by firms, government services and other bodies concerned, to determine whether they are achieving their objectives. One of the earliest such assessments recorded in the abstracts was carried out in 1963 by the Norwegian Labour Market Board to determine what had happened to 3,200 unemployed or underemployed persons, participants in short (average length: 11 weeks) courses some 18 months after they had completed their training (59). For a 60% response: 50% had obtained permanent employment; 59% had changed occupation.

	Distribution before training	Distribution after training
Farmers and forestry workers	338	215
Seamen	145	45
Fishermen	103	39
Craftsmen	302	505
Construction workers	347	355

A number of interesting research studies along these lines have been made in the USA. An article on the recommendations of the Clark Sub-Committee on Employment and Manpower, published in the " Monthly Labor Review " in November 1964, criticised the Manpower Development and Training Act and the Area Redevelopment Act (ARA) for failing to come to grips with the real problems of retraining policy, e.g. the over-emphasis of current local shortages as opposed to broader, regional or national needs (60). In 1964 the Department of Vocational Education, Pennsylvania State University, carried out a comparative study of the effectiveness of retraining programmes under the Pennsylvania Retraining Act (1952), the ARA and the MDTA. Allowing for differences in objective and approach which excluded real comparison, the project reached two conclusions of general importance: retraining should be carefully planned and be a permanent and continuing activity—the " crash programme approach " is of doubtful effectiveness (61).

These conclusions were echoed in those reached in a survey report on retraining programmes in selected European countries published in 1965 by the US Office of Manpower, Automation and Training (62).

A research project on the long-term impact of a one-firm retraining programme in the USA provides some interesting data on motivation to train: poorly educated workers are less likely to volunteer for retraining than better educated workers, older persons than younger employees, and high seniority men than low seniority men (63).

Success formulae

Retraining and further training were also the subject of an OECD project which in 1965 reported on the retraining activities in selected firms (steel production, manufacture of stainless steel articles, steam and electric power producing plant in a steel mill, manufacture of telecommunications equipment, brick manufacture, newsprint and paperboard manufacture) in six different countries in Europe and North America (64). From this and from other studies, a number of guiding principles have evolved:

— firms needing to retrain their workers should ensure that their vertical and horizontal lines of communication are good;

— a firm anticipating a technological change should carry out preparatory studies to find out how many of its workers will be affected and in what way, and the extent to which the workers' skills can be adjusted;

— in some cases training programmes should be longer than strictly necessary, so as to enable a greater number of potentially good workers to finish the courses successfully;

— whenever possible, first-line supervision must be allowed to play a useful role in the training programme, and the training should take place on the premises, where the worker feels at home.

Four lines of government action, used singly or in combination, are suggested in the report:

(1) development of technical and/or vocational schools to serve the manpower needs of an industry—financial support coming from both the industry concerned and the community;

(2) development of technical and vocational training facilities by the community, with the government offering financial and technical support to firms requiring to adapt the skills of their adult workers;

(3) incentives to encourage trade and industrial associations to create manpower service units advising on matters such as analysis of the impact of technological change on manpower requirements, assessment of skill changes needed to meet technical change, assistance in the training of instructors for retraining programmes;

(4) financial assistance to firms anticipating technological or similar changes likely to require adjustment of their work force (e.g. participation in the cost of (a) studying the manpower impact of a proposed innovation, (b) the actual adaptation of the workers' skills).

Benefit-cost assessment

The fourth phase in the retraining progression is the calculation of the costs of retraining in order to determine the benefit-cost relationship to other types of training and education. This is a comparatively recent development and the examples in the abstracts are almost exclusively from the USA.

The high investment involved in retraining programmes makes it increasingly important to assess their effectiveness. Such an evaluation should attempt to determine, in particular:

(1) the gains in employment earnings in relation to the direct costs and opportunity costs (the income foregone during the training course) of retraining;

(2) the time it takes both the trainee and society to recover the costs of retraining;

(3) the returns that can be expected from the retraining investment.

Some of the problems involved in collecting relevant and usable data were discussed at a Research Conference on Unemployment held at Boulder, Colorado, in June 1964 within the framework of a 4-year programme of research and evaluation conducted by the University of California (65).

A pilot project on benefit-cost analysis of manpower retraining was carried out under controlled conditions in West Virginia under a Ford Foundation grant: five groups of workers—trainees, dropouts from retraining programmes, persons accepted as trainees but who failed to take the courses, " rejects ", i.e. persons not accepted for training, a basic control group of unemployed " non-trainees " selected at random from local employment service files—were interviewed in 1962, followed up by mailed questionnaires and again interviewed in 1963 and 1964. Despite its limitations (smallness of the group, dissimilarity of the personal characteristics of the trainees and non-trainees, the method used for determining the opportunity cost of training and the income derived by the trainee from his training), the study provided evidence that the real benefit and potential benefits of manpower retraining substantially outweigh costs.

It also demonstrated, however, the impossibility of distinguishing the effects of the specialised skill acquired in a training course from other advantages, such as increased versatility and positive impact in job interviews, attributable simply to the fact of having completed a course (66).

Attempts have also been made to determine the relative benefits and costs of retraining the hard-core (or long-term) unemployed as compared to the more easily retrainable. A study of MDTA retraining programmes in Connecticut shows that the hard-core unemployed cost more to train: their level of education is usually lower so they are more likely to need remedial courses in basic education; their cost in training allowances will be higher, and so will their dropout rate. Once trained, however, they do get jobs and their subsequent employment stability is high; their gain in income has been proportionately higher and the government's savings in subsequent unemployment costs are estimated as seven times higher for the retrained hard-core group than for the others.

Nevertheless, concludes the abstracted article, the economic benefits of retraining the hard-core jobless do not equal the costs. Economically, it would be sounder to concentrate on retraining the better qualified workers. Their capacity and motivation for training are greater and they can be trained for certain more senior posts that the hard-core unemployed could never hold even with optimum training. In addition, the less employable workers would still benefit indirectly through a " vacuum " effect, since when any worker is upgraded he leaves a vacancy into which an unemployed person of lower skill level will be drawn.

" Under such circumstances, the direct costs to society from training a normal unemployed person would be no higher, but the aggregate benefit and savings would be greater. Except, therefore, in cases where, because of large numbers of workers who are not equipped to do any job at all, a vacuum effect would not operate, retraining the hard-core unemployed is not economically advantageous." (67)

Vocational rehabilitation

Retraining of the physically handicapped is one of the aspects of vocational training which fulfils both a social and an economic purpose, but until comparatively recently it is the former which has been the dominant feature. As pointed out in a book on the economics of vocational rehabilitation, published in the USA in 1965, invalidity and disablement have varied and far-reaching repercussions on the national economy. Quoting from the relevant abstract: " The direct consequence of invalidity is a decrease of national income resulting from reduced production. To this should be added the personnel needed for looking after the handicapped, which represents a further reduction of the national product. In the United States of America there are between three and four and a half million handicapped persons who are incapable of gainful employment, and almost as many whose wage-earning capacity is limited. The global cost in terms of wages lost as a result of invalidity is estimated at more than US $11,000 million. Furthermore, the care and personal services needed by handicapped persons represent an additional burden on the taxpayer." (68)

The cost to other countries can be calculated by adjusting the basic figures for the number of handicapped persons in the country, their probable earning power, etc. In a tight employment market situation, the numbers involved and the loss of their skills become important factors for economic growth. The full employment situation in European countries since the 1950s is therefore probably one of the main reasons for the considerable amount of attention being paid to vocational rehabilitation during the period under review, and for the strides which have been made towards a new attitude towards the disabled in employment.

In nearly all cases the accent is on careful planning and integration of all the services concerned: medical, vocational, scholastic, placement. This was highlighted early on in the abstracts in a description of a model rehabilitation centre at Heidelberg in the Federal Republic of Germany (69). The same theme was repeated in an article on the guiding principles of rehabilitation policy in Switzerland (70) and in the conclusions reached by an ILO-sponsored seminar on vocational rehabilitation which studied, in particular, the comprehensive rehabilitation system, with its network of co-operative workshops, set up for the disabled in Poland (71). It is the key to the decision in the USSR to set up two large rehabilitation centres, one in Moscow and the other in Leningrad, which will combine, in one co-ordinated unit, all the rehabilitation facilities now provided in different establishments and under different forms (hospitals, sanatoria, courses, etc.) scattered all over the Russian Federation (72).

It is typical of modern attitudes to disablement that the handicapped person is no longer automatically directed into undemanding jobs, sheltered employment and occupations " traditionally " considered suitable for them. An equally important principle stated in a German article is that handicapped persons must be helped to maintain their social status (73). A great deal of research is still needed on training methods for the handicapped and on medical/technical aids and devices to help achieve this objective. Some of these fields for research are discussed in a memorandum prepared by the Central Committee for Rehabilitation in Sweden in 1963 (74); an article from Norway outlines ways to improve in-plant training (75). While institutional care and sheltered workshops remain essential for certain categories of handicap, the trend is towards integrating disabled persons as soon as possible into a normal occupational environment.

It follows that new occupational fields are being opened up for the physically handicapped. The abstracts contain references to training blind persons for computer programming and electronic data processing in the USA (76, 77) and as yarn spinners in Israel (78). In Switzerland persons with various handicaps are being trained as punched-card specialists (79). Four examples do not make a trend, but they point the way.

For the developing countries of the world, the problem of the disabled is still solely a social one. Employment opportunities are short for the well, non-existent for the handicapped. A series of three articles on India presents a typical picture of the size of the problem and stage of solution (80-82). A beginning is being made, but the experimenting is largely being done by outside agencies and private institutions, for example the UN demonstration project for training blind rural workers in Uganda (83). These countries lack the economic compulsion present in the labour-short countries of Europe and North America—which is perhaps why the government of Somalia passed a law in 1963 to oblige employers to employ one handicapped person for every 30 fit workers on their payroll (84).

Training for the mentally retarded and the " backward " child and adolescent is another problem which is being discussed in many quarters. Isolated references, descriptions of programmes and experimental projects have been included in the abstracts but the field is still virtually unknown in vocational training literature.

The disadvantaged

Two studies on the training of the hard-core unemployed—a demonstration research project under the auspices of OMAT to test the efficacy of training programmes for hard-core unemployed in Virginia (85) and a paper on the causes and remedies of hard-core unemployment in Detroit (86)—show up another socio-economic aspect of vocational training. The latter, in particular, demonstrates clearly the cumulative impact of all the social elements which can mean that a person is included under the single term " disadvantaged ", and of which lack of education and skills is only one item among many.

The out-of-school youth may not have been socially or economically disadvantaged to start with; he may simply have been bored, but he runs the risk of ending up among the hard-core unemployed. The same may be true of the immigrant unable to cope with his new environment, the farmhand who has drifted to the nearest town and cannot compete with the urban-educated worker, the Negro who has not had the benefit of guidance and encouragement, or has encountered active opposition in his struggle for social advancement.

There are a few scattered examples of action to combat or to prevent these incipient ills. There have been attempts to determine the incidence of education on unemployment in the province of Quebec, Canada (87), or the influence of social environment on choice of educational stream and future occupation, as in a study made in the canton of Geneva, Switzerland (88). There are examples of pre-emigration training organised for Italian nationals planning to work in one of the other Common Market countries (89) and the establishment of training courses for Italian immigrants settled in Canada (90). But the latter are special measures governed by unique conditions. The principle of mobility of labour within the Common Market demands action to upgrade the immigrant for easy assimilation of the social standards of the receiving country. Moreover, in both cases there is a tight employment market for the right skills. An unemployment situation might quickly curtail such activities and keep the potential migrant at home, or at least put a brake on the migration movement.

There have also been a number of measures and programmes to encourage vocational training and further education in rural areas, in Poland (91), for example, and the Federal Republic of Germany (92), as in France (93), Austria (94, 95) and Spain (96). On a larger scale there are practical examples of legislative and other formal action to stimulate the economic development of whole areas which have become " depressed " or are insufficiently developed. The most comprehensive of such examples are, of course, the Area Redevelopment and Economic Opportunity Acts in the USA—but these are only two of the manpower resources development instruments referred to in the President's 1965 manpower report (97). The last example, drawn from the European scene, is the work of the Agency for the Development of Southern Italy, one of the main factors which have helped to transform the social and economic outlook in the area since the latter part of the 1950s (1, 98).

Expanding the scope of the training system, in particular with a view to taking within its orbit areas and population groups which have not previously been able to benefit from it, is a common trend for all countries. It is obviously a response to both social and economic pressures.

II. Systems and organisation of education and training

The current content and organisational structure of the systems of education and training have all been influenced by the social and economic problems and situations outlined in the previous chapter and, particularly in the developing countries, by a general scarcity of financial resources and shortages in the supply of qualified teaching staff. But the extent to which they have been influenced, and the timing of their evolution or rhythm of change differ for each, largely to take account of two additional factors: the political structure of the country concerned and the development stage of existing institutions. Consequently there are parallel trends, each one or more steps behind—or in advance of—the next.

The springboard of the 1950s

The abstracts service started at the end of 1961. With rare exceptions therefore, no trends or developments prior to 1960 have been recorded. This is almost a pity as for many countries the 1950s were intensely active, both legislatively and organisationally, as regards education and vocational training, partly because of the prolonged period of relative stagnation during the economic depression years of the 1930s and the war and immediate post-war periods of the 1940s. Some of the abstracts in the first volumes show the repercussions of these earlier events and organisational innovations.

New apprentice training legislation, for instance, was adopted in Denmark in 1956, and in 1960 a law was passed which aimed at creating possibilities for the systematic further training of more than 400,000 adult workers. Its main purpose was to close the educational gap between trained and unskilled workers. In 1962, government services, employers and all bodies concerned were attempting to assess the results achieved during the first two years of the latter's implementation (99-101). Apprenticeship legislation was passed in Israel in 1953, Italy in 1955, the Philippines in 1956 and Ireland in 1959. Some of the results of the Israeli experiments in vocational training were described in a paper prepared for the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas in 1962 (102). In Italy the government's policy in apprenticeship was under heavy fire in 1962, particularly from the trade unions, as shown in an abstracted article entitled " Apprenticeship, year zero " (103). The first abstract on Ireland is concerned with the first annual report (1961) of the National Apprenticeship Board set up under the Act of 1959 (104). Ten years after it was passed, the Philippines' Apprenticeship Act was being criticised in 1966 by both government and employers, agitating for reforms (105, 106).

In much the same way the findings of the Australian Commonwealth-State Apprenticeship Inquiry were published in 1954 and their implications were still being discussed in Sydney and Canberra—and in the abstracts—in 1961 (107). The first federal-provincial action for education and training in Canada was taken in 1946 with respect to providing training for the unemployed; the Technical and Vocational Training Assistance Act of 1960 was brought into the abstracts collection with the 1963 amendment (53).

The same situation can be seen as regards the organisational structure of education. A radical reform of the educational system was introduced in the USSR at the end of 1958; a year later a no less important educational reform began in France. The implications and repercussions of these two reform movements have been followed in numerous abstracts right through all six volumes, but the initial events occurred too early to be covered. 1959 was also the year in which Norway introduced a basic law on educational reforms; an early abstract published in volume I describes the resultant reorganisation of the school administration, with particular reference to vocational and technical training (108). A reorganisation of industrial vocational training was introduced in Spain in 1955, and the comprehensive education-cum-training system represented by the " Universidades laborales " was instituted a few years later (1959). Neither development was included in the early volumes of the abstracts, but by 1965 the authorities, concerned over the short-fall in these measures, were calling for sharp increases in in-plant training to reinforce the official, school-based industrial vocational training system in order to meet the country's economic development plans (109).

The above are no more than examples of some of the important events which have had a part in setting the tone and the pace of developments in education and training. Against the background of this action taken before the service started, the abstracts show, for the short period they cover, the general lines of development in this field in the recent postwar period: basic reforms, frequent and comprehensive stocktaking of developments and trends in each country, and rapid adjustment to change.

Developing countries : special problems

In the developing countries, much of the legislative and organisational action in the vocational education and training fields reported in the abstracts—as well as the developments which for one reason or another have not been included—must be interpreted as the first attempts towards changes to take into account new political structures, revision of composition of administrative or consultative bodies, re-allocation of ministerial responsibilities for education and training, and so on. In the early 1960s, for instance, new labour codes were promulgated in Gabon (1961), Jordan (1960) and Libya (1957, 1962); in 1961 El Salvador approved a decree to promulgate the apprenticeship Act passed a few years earlier, and in 1964, shortly after independence, Malawi and Zambia issued apprenticeship ordinances. In 1961, too, Ghana had adopted new apprenticeship legislation (110), and at much the same time India and Pakistan respectively adopted measures to repeal the Apprentices Act of 1850 and institute new apprentice training regulations (111, 112). The National Council for Technical Education and Vocational Training in Cameroon was reorganised by decree in 1962 (113), and measures were adopted in 1964 for the repeal of earlier apprenticeship legislation in Madagascar (114) and the creation of CAP trade certificates for industrial and commercial occupations in Mali (115).

Some of the measures, especially the more recent ones, have interesting features. There is the general trend to take a broader view of technical and vocational education and training, to consider it a tool for general human resources development—the over-all manpower approach discussed in Chapter I. Some evidence of this trend can be deduced from the number of training and education bodies which, in name and in fact, have been given wide responsibilities. The Central African Republic, for instance, linked training and employment questions when setting up the Study Centre for Labour and Vocational Training (116). Colombia set up a National Board for Employment and Human Resources in 1966, giving it wide powers and requiring it to work in close co-operation with the Planning Department (117). The Board of Planning for Education and Social Development created in Iraq in 1966 is another example (118), as are the Employment and Human Resources Service of Peru's Ministry of Labour (119) and Tunisia's National Council and National Bureau for Vocational Training and Employment (120, 121).

In a few instances there has been legislation to institute a system where no formal structure had existed previously. A case in point is Cyprus where apprenticeship legislation was adopted in 1966 after a period of investigations and a pilot project intended to examine whether apprenticeship schemes could be introduced in the island (122, 123).

Adaptation to local situations

There are also examples of attempts to take a new look at existing systems of education and training and to introduce new ideas better adapted to the individual country's special needs and stage of development. It is chiefly in the organisation of education that this trend can be distinguished from the abstracts. A complete reorganisation of the educational system in Chile in 1965 introduced a system of nine years of basic general education consisting of a four-year common basic period followed by a five-year period emphasising vocational orientation (124). The new (1967) educational system in the Republic of the Congo specifies that education shall comprise two categories: general education and technical and vocational education. For both categories and all levels—primary, secondary and higher—theoretical instruction is to be linked with practical instruction and manual work, and there is to be a two-year observation cycle in the primary education programme to determine subsequent educational orientation (125). In 1967 North Korea decided to make compulsory its nine-year school programme with a technical bias (126), while the new organic law on education in Honduras includes in its scope " out-of-school " education (127).

In India an interesting arrangement has instituted a certain equivalence between basic apprentice training and the first year of instruction at an industrial training institute (128). Another new development is the relative autonomy given to each of the technical vocational committees, set up for the various branches of economic activity under the Algerian Ministry of Economic Affairs for establishing its own plan of action, taking the measures required for its implementation and assuming responsibility for its own budget and finance (129). The institution of such a network of technical vocational committees is not unlike the system of industrial training boards set up in the United Kingdom under the 1964 Industrial Training Act.

On the whole, the measures and legislative action taken by these countries tend to reflect trends in education and training systems which are more easily discernible in the more industrially-developed countries on which they have largely been modelled. It is true that in recent articles and studies it is possible to detect a tendency to reconsider the suitability of such systems for the countries which have adopted them. But too little is known about such efforts as yet. The energies of the developing countries have been action-oriented. There has been little time or inclination for contemplative writing about what is being done or planned. All too often the documentary material available has been written by an outsider who inevitably has applied foreign criteria in his assessment of events and tendencies. For this reason it is easier to follow the highlights of developments in education and training during the last five to six years through studying trends and developments in Europe and other highly-industrialised areas. It has been possible to cover them in greater detail and more consecutively in the abstracts right from the start of the CIRF service in 1961.

Plans and national inventories

There has been a characteristic wave of planning for education and training throughout the period under review, and more than ever before the plans have been based on systematic assessment of facilities, aims and needs. There have been multitudinous public and private surveys and inquiries. Their general objective has been to discover present input of training and education systems—the people and the operational institutions—to assess their capacity or output, to determine desirable output and then to draw up a balance sheet with a view to determining the action needed to achieve, or restore equilibrium.

These investigations can be classified into several categories according to their scope and objectives. There are the comprehensive governmental inquiries: the New Zealand government commission set up in 1964 to inquire into and make recommendations for the entire system of vocational training in industry and commerce (including apprenticeship and technician training) and to propose legislation to give effect to recommendations resulting from the inquiry (130); the inquiry carried out by the Commission on Higher Education in Papua and New Guinea, at the instigation of the government of Australia, which also was broad in scope and far-reaching in its long-term recommendations (131); the Swedish committee set up by the Minister of Education in 1963 to investigate and report on the objectives, role, content and organisational structure of vocational training (132).

There are also all the economic development plans, which today inevitably have chapters on education and training. But few of these have been included in the CIRF collection of abstracts: the relevant sections of the French Vth Plan (133), Pakistan's third five-year plan (134), Uganda's second five-year plan for the period 1966-1971 (135), the economic and social development plan (1966-1970) published by the Republic of

Togo in 1965 (136), and a general report on the development of manpower resources published for the Republic of China (Taiwan) by the country's manpower resources committee in 1966 (137).

Frequently, the governments have called in outside experts to assist them in carrying out the inquiry—the International Bank for Reconstruction and Development, for instance, the United Nations Educational, Scientific and Cultural Organization, the International Labour Office, the Organisation for Economic Co-operation and Development, etc. Cases in point are the IBRD studies on the economic development of Kuwait (138) and Papua and New Guinea (3) which contain extensive chapters on the organisation and future development of education and training, the ILO report to the government of St. Lucia on the development of vocational training (139), and UNESCO's survey of education in the Arab states (140) and project in the Ivory Coast with a view to planning the country's technical education system (141).

Many of the inquiries are less ambitious in scope, but perhaps technically more interesting, limited to a specific aspect, situation or group of people:

— the inquiry carried out in Czechoslovakia by the Sociological Institute of the Bratislava Academy of Science with a view to analysing the extent to which adolescents terminating secondary school look on their studies as a means of continuing their education or as a preparation for their future career (142);

— the attempt made by the Ministry of Labour in Hungary to ascertain young people's attitude towards their school, practical work and choice of career through a questionnaire inquiry addressed to secondary school pupils before and after leaving school (143);

— the Indian government's inquiry in 1963 to determine the extent of unemployment and underemployment among persons who have completed secondary education (144);

— the findings of the Henniker-Heaton Committee on day-release from employment for further education for young people in the United Kingdom (145) and the survey of scientific and technological manpower (including technical supporting staff) in Great Britain in 1962, undertaken by the Committee on Scientific Manpower of the UK Advisory Council on Scientific Policy (146);

— the US government's report on apprenticeship and economic change, and special labour force report on out-of-school youth, both of which were published in 1964 (147, 32).

But this list, already long, has made no mention of the wealth of material assembled in independent studies such as those carried out by the Harbison and Myers team in their research reports on skilled manpower, in e.g. Malawi (148) and Puerto Rico (149); or, in the Federal Republic of Germany, by the Göttingen Institute for Social Research and the Promotion of Personal Development to determine the origin, education, work and career prospects of young unskilled workers (150); or the inquiry, carried out by the Workers' Council of the International Confederation of Christian Trade Unions among its affiliated national organisations, into the situation as regards education and vocational training for women (151), to mention only a few of the more important ones which have been reported in the first six volumes of the abstracts.

A trend in its own right, the wave of stock-taking and planning provides an essential element for understanding the current educational and vocational training reforms.

Educational reform

Whatever the formula adopted, the reforms in the educational systems have been inspired by roughly the same objectives:

- — to reach the greatest possible percentage of the school-age population;
- — to enable each child to attain the highest level of education of which he or she is capable;
- — to give each adolescent as good a preparation as possible for entry into the active labour force and, at the same time, a grounding which will facilitate further training and education later on.

The polytechnical concept

This latter objective was, in intention as well as in name, the main purpose of the law passed in 1958 by the USSR to modify the school system in order to " reinforce the links between education and life ". By mid-1962, according to an article published in "Narodnoe Obrazovanie ", an official journal issued by the Ministry of Education, most of the secondary schools in the USSR had been reorganised on the 11-year basis and were providing production training from the ninth to eleventh years (152). The production training was normally divided into two stages: during the first stage the pupils were progressively taught the basic techniques and more difficult operations typical of the selected trade; during the second they were enrolled in the production departments of collaborating undertakings. At the end of the stage there was a trade examination and the successful candidates were awarded a certificate and classified into an appropriate category of worker.

The duration of the first stage of production training varied in length from one school to another, and even for the same trade. Some of the schools, particularly those training pupils for the chemical industry, deliberately prolonged the first stage so as to give their pupils a more thorough theoretical knowledge of their future trade. This prolongation of the first period, however, was soon criticised: it seriously reduced the time available for the second stage, correspondingly diminishing the value of the training; it was more expensive, placing an additional financial burden on the collaborating undertaking by immobilising for training purposes equipment which could have been used for production (153).

Originally, these schools had been thought of as a single unit with classes going from the first year right through to the eleventh. After four years practical experience of the reform, it was found more satisfactory to operate the three final years as a separate unit. In addition, a certain number of measures (such as reducing the number of trades being taught) had had to be taken in order to gain the parents' acceptance of the vocational bias of these schools, to diminish the dropout rate and generally to improve the standard of the training (154). A year later, in 1964, the Central Commission of the Party and the USSR Cabinet decided to reduce the curriculum from 3 years to 2 years. " Training for work " was to be developed through a more extensive application of the principle of polytechnical education and the school workshops were to be modernised. Production training should assume more of the character of preparation for learning a trade than for practising the trade itself (155).

This change was essentially reverting to the original intentions of polytechnical education: the provision of instruction in the basic sciences and techniques which will lay a foundation for subsequent trade training. The subject matter to be taught in the production training classes would relate to three main aspects: production tools (general knowledge of mechanised and automated production equipment), industry (an over-all view of the main industrial sectors and the corresponding production processes), and the techniques of production work (156). The total time allowed for trade training in the ninth and tenth years of school was set at 708 hours, while 2,100 hours were to be devoted to general education subjects (157).

With the exception of Poland, the countries of Eastern Europe have all, to a lesser or greater extent, followed the lead of the USSR in introducing polytechnical education and a general secondary school programme with production training organised in school workshops and in the production departments of collaborating undertakings. The system was formally adopted by Eastern Germany in 1963, by a decision which decreed that a certain amount of " suitable " production work from the undertakings should be introduced right from the fourth year of school, and that two new basic courses—industry and agriculture—should be included in the syllabus for the seventh to tenth forms or school years (158). It was subsequently confirmed in 1965 by the basic law on the unified socialist educational system (159) which stressed the polytechnical character of the 10-year common basic school.

Compulsory schooling

The main reform movement in Poland began with the extension of the period of compulsory education from 7 to 8 years, which has been progressively introduced since 1961, and the consequent modifications made in the programmes and curricula of both the basic vocational schools and, ultimately, the industrial technical schools (160, 161). As from September 1967, new syllabi were to be introduced into both these types of school. Most of the trade courses in the former will have a duration of two years, and general education subjects in the syllabi will in principle be a continuation of the education received during compulsory schooling. The syllabi of the technical secondary schools will be modelled on those of the senior general secondary schools: the general education and science syllabi will be exactly the same; literature, civics and defence training will be very similar; history and geography will follow the same syllabi but in condensed form; general biology will not be taught, and only one foreign language will be taught, instead of two. In addition, the industrial technical schools are to have " economics of industrial undertakings " as a compulsory subject, which will be adapted to the particular trade being taught (162).

This prolongation of the compulsory schooling period, and subsequent adjustment of training programmes, is typical of the post-war period. There has been a steady and common trend towards at least 8 years of compulsory education for all, with a 9-year or 10-year period applied or under discussion in many countries.

Observation and orientation

The general intentions of the successive educational reforms introduced in France since 1959 are not so very different from those just discussed above. Compulsory schooling was to be extended to include all children up to the age of 16 (effective in

1967) and a four-year period of systematic scholastic and vocational orientation and guidance has been instituted. As expressed in one abstract of an article written at the time of the 1963 amendment to the initial Decree: " Out of every 100 pupils entering primary school, 8 are transferred in course of study to special educational establishments for maladjusted children, 46 end their schooling with the final class, while of the 46 remaining, 25 continue in the general education streams and 21 enter secondary schools... Only 5% enter technical secondary schools " (163). It was in part to redress this imbalance between the two main streams of education that the reforms were introduced.

With the introduction of a new type of " multi-purpose " secondary school and various other measures intended to give pupils full possibilities of orientation and a broader education generally, the whole of the first period of secondary education in France has become, in effect, an orientation period. Only in the ninth year of school are the children separated into different streams (163-166). The reorganisation is backed up by a tremendous school-building programme—some 2 million dollars spent each working day on the construction or enlargement of different types of school premises (167)— as well as systematic and constant efforts to guide suitable youngsters into vocational and technical streams of education. The authorities wished to relieve the seriously overcrowded general education sector yet at the same time provide each youngster, at each level, with an educational programme within his individual range of achievement.

Educational choice

Habits die hard, however, and reforms do not become effective overnight. By mid-1964, measures were being introduced, along with the general reform of senior secondary education, to strengthen the orientation given at the end of the ninth school year and to stream pupils lacking the aptitude for the traditional type of secondary education syllabus into technical and vocational education (168).

General reluctance to select a technical or practical stream of education seems to be a fairly universal trend. The introduction of a ninth year of compulsory education in Sweden, with thirteen different streams, met much the same problem. One year after the new 9-year common basic school system was introduced, about 80% of the school population in the 15-year age group preparing to enter the ninth-year classes had indicated preference for one of the theoretical streams, leaving only 20% for the practical ones. As pointed out, however, in one of a series of articles on the initial consequences of the school reform, the capacity of the secondary schools had been planned to accommodate only about half of the children leaving common basic school. A selection would therefore still have to be made, in spite of the principle of free choice of studies (169, 170).

Education or training?

Increased integration of education and training has in some cases resulted in the establishment of a unified administrative structure for all educational activities, including vocational training for young people and adults. In Sweden this approach led to the establishment of the Central Board of Education in 1964 which was expected by the Vocational School Association to have the psychological effect of making vocational training equivalent, in the eyes of the public, to any of the theoretical streams of the general school system (171, 172). The next step in the assimilation process was a recommendation of the Minister of Education's special Committee on Vocational Training that there should be complete integration of the three existing types of secondary education: general, technical and vocational. Since it was no longer possible to draw sharp lines between the aims and programmes of these types of school, the traditional classifications no longer had either validity or practical meaning, the Committee concluded. The distinctions should be based instead, either on the orientation of the different streams of training as regards broad sectors of activity or on the occupational fields in which their graduates are likely to find employment (132).

These developments are fairly typical of a general trend which is making it increasingly difficult to say exactly where and when vocational training begins. It used to be possible to state categorically for most countries that education took place within the educational system, and that vocational training, whether institutional or not, took place outside it and on completion of the period of compulsory schooling. Today, with the polytechnical education systems in the USSR and many of the countries of Eastern Europe, with the general move towards prolongation of compulsory education and the inclusion of various types of prevocational or orientation classes in the latter years of primary schooling, with the increasingly common practice of instituting a common curriculum up to the end of junior secondary education and of establishing multi-purpose schools, this distinction is no longer entirely valid. When one adds to these trends the fact that there is an equally prominent tendency to organise at least part of the initial, basic period of vocational training in a school atmosphere, one is forced to take a much more flexible view of the significance of the term vocational training. The frontiers between education and training have been shifting—or are disappearing altogether.

Legislative changes

Legislation concerning vocational training tends to fall into one of two categories. It either consolidates or clarifies earlier regulations or it can introduce innovations. On the whole, for obvious reasons, the texts adopted in the highly developed countries of Europe and the Americas usually belong to the consolidation category. The federal law on vocational training adopted in Switzerland in September 1963 and the new (1966) apprenticeship Act in the Netherlands are recent examples. Neither can be said to have introduced any very radical changes in the earlier legislation they have replaced.

Three innovations in the Swiss law, however, are significant as indicative of the winds of change. Firstly, the new law contains a section on vocational guidance—recognition of the importance of training being based on a well-informed choice of occupation. Secondly, where the 1930 law provided for only one level of certification, the new Act provides for two: a trade examination and a master's examination, with the latter requiring some knowledge of business management, economics, etc. In other words, it recognises that skill alone is not sufficient for success in a trade or business. Thirdly, further training occupies a far larger place in the new law, which is concerned with courses for semi-skilled workers, specialisation courses and courses for retraining and promotion, as well as preparatory courses for the higher technical schools or other higher level secondary and post-secondary education. Viewed together with the fact that the vocational guidance services, declared optional and free of charge, are intended to assist both minors and adults, this latter innovation can be taken as support for the principle that vocational training is a lifetime process (173-175).

The Dutch apprenticeship law has also been concerned chiefly with updating earlier legislation, in this case the relevant provisions of the Vocational Education Act of 1919. It is to be complemented by a new law on vocational education. Essentially it confirms the system of " mixed " vocational training—that is, full-time training in a vocational school followed, in most cases, by a period of systematic training within the undertaking—as it has evolved in the Netherlands over the past 40 years. By definition and intent it is concerned exclusively with initial, basic training for a skilled trade provided within the firm or undertaking. But it recognises that such training is not the sole prerogative of youth since, in setting the maximum age for an apprentice, it has raised the age limit from 21 years to 27 years (176).

Nation and state

The proposal that there should be comprehensive legislation to regulate vocational training in the Federal Republic of Germany, has precipitated much discussion and argument. Those in favour of new legislation point out that vocational training in the Federal Republic is regulated " by a series of texts: scattered provisions in federal laws on other subjects, state laws and, above all, countless local Orders and apprenticeship regulations established by the Chambers of Artisan Trades and of Industry and Commerce" (177). It is a typical situation requiring the consolidating action of legislation. A basic federal law would be in the interests of both the nation and the trainee. There was no need to fear encroachment on the sovereignty of the states as regards education.

Such a text should:

— lay down principles, in particular the principle of equality of opportunity for training;

— cover all types of training and every category of trainee;

— provide a more satisfactory definition of the persons qualified to train and the respective duties and responsibilities of the parties concerned;

— give training a new organisational structure in which the workers' organisations would have a larger role to play (177).

The political structure of the country does nothing to simplify the problem. Of necessity, federal action in the field of education and training must respect the prerogatives of the states. The same type of broad approach is the one which has been adopted in other countries with a federal structure, as in the Swiss vocational training Act, referred to earlier in this chapter, and in the legislation on the subject adopted in Canada and the USA. In both the latter countries, but particularly in the USA, the development of legislation on education and training during the 1960s has constituted a veritable revolution tending to place major policy and financial responsibility on the federal authorities, and to diminish the importance of both private initiative and financing and the policymaking tasks of local and provincial (or state) authorities.

In Canada, federal action in the vocational training field has been limited to support services for provincial training programmes. The federal-provincial programme (1946) and the 1960 Technical and Vocational Training Assistance Act, and its subsequent amendments, provided for federal assistance towards meeting expenses incurred by the provinces in undertaking a technical or vocational training programme for certain categories of persons. The latter included apprentices, unemployed persons, supervisors in industry, persons discharged from the armed forces, teachers and persons responsible for carrying out technical or vocational training programmes, disabled persons and others needing retraining to improve their employability (53). The assistance provided by the federal government might cover capital expenditure as well as the cost of training allowances. But the accent was on assistance to defray the cost of training organised to meet the situations which, for one reason or another, were out of proportion with respect to the training commitments which could normally be expected at provincial level: the training or retraining of unemployed persons, disabled persons, members of the armed forces, etc.

Without destroying this basic division of responsibility between the federal-provincial partners, new legislation passed in 1967—the Adult Occupational Training Act—has widened the scope of federal intervention in this field and is likely to result in promoting and extensively expanding provincial training programmes and schemes. Federal assistance will now be available on behalf of any " adult " wishing to undertake occupational training—and an adult has been defined as " any person whose age is at least one year greater than the regular school leaving age in the province in which he resides ", and occupational training as " any form of instruction, other than instruction for university credit, to provide a person with the skills required for an occupation or to increase his skills or proficiency in an occupation ". The Act also authorises federal payments in respect of costs incurred by the provinces in undertaking research on occupational training, mentioning in particular projects for the development of occupational training courses, training aids, examinations and standards. It is not unreasonable to expect that, in course of time, the body of provincial training regulations and recommendations will be welded into a homogeneous code of standards applicable from the Atlantic provinces to the Pacific coast (54).

The same type of federal policy can be seen in the USA. The 1963 Vocational Education Act (37), heralded by the President's message " Programme for Education " (31), initiated a vast programme for expanding, strengthening and improving the quality of vocational education. But federal funds and federal action in this field are intended as an encouragement for action by the states; they must be used only to supplement—not to supplant—state expenditure for vocational education and training (178). The Act itself was based on the recommendations of President Kennedy's Panel of Consultants on Vocational Education which laid down an action policy for the 1960s. Vocational education, said the panel, must offer training opportunities during this period to 21,000,000 young people who were not college graduates, must provide for the initial training, retraining and updating of workers displaced by automation or economic change, must arrange further training and education beyond the secondary school level for craftsmen and technicians, and expand vocational training programmes generally (179).

A built-in feature of the Act is the close co-operation between the public employment offices and the state boards of vocational education. States receiving federal aid must provide a plan for their proposed vocational programme. Such plans must require state employment offices to make available occupational information regarding employment prospects. The state boards and local educational agencies will use this information (i) for student guidance and counselling, and (ii) for determining the occupations for which training will be offered. Such advance planning is tending to attach greater importance to combined training for jobs which use related skills. It is also tending to give new impetus to training provided in area technical and vocational schools, serving more students in wider geographical areas since, for the first time, federal funds can be used for the construction of such facilities.

In the Federal Republic of Germany the debate still goes on. At present two Bills, each submitted by a different parliamentary group, are before Parliament for consideration: the employment market adjustment Bill and the vocational training Bill. As may be deduced from their titles even, they present divergent views on certain points. There is a difference of opinion as to the authority to have prime responsibility—whether it should be the Minister of Labour and Social Affairs or the Minister of Economic Affairs. This is no mere formal problem of terminology. It is a problem which is unlikely to be solved very quickly. Another technical aspect may also present certain difficulties: the provisions which, in one Bill, suggest that training regulations "may provide for training by stages" and in the other that training regulations "shall, whenever feasible, provide for training by stages" (180). The system of training by stages has many and ardent supporters but not everyone may be convinced that the time is ripe for it to be formally recommended in a national law.

Industry-based training

The tremendous efforts being made in most countries to expand, renovate and reorganise the educational system, including technical and vocational education, run the risk of detracting from, or covering up the importance of the work being done by industry in training young skilled workers. As an example, it has been estimated that of all youngsters learning a trade in France in 1962, 51% were learning it under school conditions, while 49% were learning the same or an almost identical trade on the job under an apprenticeship contract (181). To all intents and purposes, therefore, apprenticeship within the undertaking is a recognised alternative in France to full-time training in schools. But the French apprenticeship system, with its rather complex organisational and financial structure dating back to legislation passed in the 1920s, has been the target of strong popular demand for rationalisation. At least two major national committees—the Masselin Committee and the Chenot Committee—have made recommendations for reform. The latter have been largely administrative or financial, attacking in particular the complexity of the machinery for assessing, collecting and disbursing the appropriate levy, machinery which (according to its critics) successfully defeats its own ends (182).

Apprenticeship intake

One of the important problems facing the French artisan trades today, as pointed out in a manifesto published by the National Union of the Staff of Chambers of Artisan Trades in December 1964, has been to foresee and prepare for the impact of the educational reforms on apprentice training. There are fears that prolongation of compulsory schooling will bring about a sharp decline in recruitment into the principal trades: at the age of 16 adolescents are often less receptive, already have exaggerated pretentions and may be reluctant to enter certain trades which, as a result, will later on experience a real manpower crisis. Moreover, adolescents entering apprenticeship at 16 will only complete it when they are about to be called up for military service. Those who complete their training will not have had time to get firmly entrenched in their trade; those who fail to obtain their trade certificate at the first attempt will leave for military service without having acquired any occupational qualification (183).

As pointed out in the CIRF monograph on apprentice training in selected countries in Europe (184), this change in the apprenticeship intake is a common trend. The average apprentice is older but of lower average educational level than previously. Numerically, too, many countries report problems as regards apprenticeship intake. New Zealand experienced an absolute increase between 1953 and 1958 but at the same time a sharp relative decline: 5.8 in 1953 compared to 2.6 in 1958. These figures hide regional fluctuations and changing trends in the popularity of certain trades and occupational categories. Carpentry, motor mechanics and plumbing were hardest hit; the electrical trades, furniture making and body building were more or less stationary; engineering and the printing trades were on the upgrade. The average intake was nevertheless considered unsatisfactory (185).

In the Federal Republic of Germany, the artisan trades were suffering a decline in the early 1960s compared to the previous decade, although the actual intake rose; the building trades and textile industry lost between 9% and 13% of their apprentice " quota ", the metal trades gained about 15% and so did the personal services (186). It must be remembered, however, that the bulk of the apprenticeships take place in large scale industry and in commerce, not in the artisan trades sector. A rather special situation exists in the USA where there is immense concentration of apprentice training in three broad sectors: the building trades (65%), the metal trades (15%) and the printing trades (8%). Moreover, since the total number of registered apprentices in 1962 was only 159,000, apprentice training is relatively unimportant as a means of obtaining skill qualifications. By far the commonest system is through full-time or part-time training in a vocational or technical school or college, or through training in employment not covered by apprenticeship regulations (187).

Organisational and technical problems

Italy, like France, is a country where the major efforts of the past few years have been directed towards the reform and reorganisation of education, both basic general education and vocational/technical education. But apprenticeship remains the sole training channel open to young people who, immediately on completion of their compulsory schooling, are obliged to take up employment in order to augment the family income. As already mentioned above, the 1955 apprenticeship Act—or perhaps more correctly, the application or non-application of the Act—is under constant pressure and criticism from all parties concerned. Its application is ineffectively supervised and its provisions are often violated. " Instead of being trained, apprentices are often assigned to real production work and are given tasks which are quite unconnected with their future trade... apprentices are sometimes engaged directly by the undertaking, instead of passing through the employment offices. They constitute cheap labour and are subsequently maintained as apprentices for more than the legal maximum (5 years). ... Related instruction, limited to three to four hours a week, generally fails to take into account the apprentices' level of education and real training needs. Their tasks in the workshop and their classes of theoretical instruction are rarely co-ordinated." (5, 103, 188).

None of these criticisms is new. All of them have been, and still are being, raised in many other countries. A US government paper on the ability of apprentice training to adapt to economic change quite frankly admitted that many people considered apprenticeship an obsolete method requiring radical revision (147). A paper submitted to the Research Conference on Unemployment, held at Boulder, Colorado (USA) in 1964, pointed out the immense variation in the standards obtained in apprentice training. The major—or " good "—trades are those which demand more individual skill and responsibility: electrical trades, pipe fitting and sheetmetal work. But there are at least five other channels through which a man can qualify for skilled occupations in the building trades, the major apprenticeship sector: by completing only part of a formal apprenticeship, through informal apprenticeship, by learning it in a non-union sector of the industry or at a vocational school, by picking it up on the job. Only 38% of new entrants actually become formally apprenticed. There is little incentive to do much about improving the content and organisation of the system (189).

Solutions

In France the answer to some of these problems is seen not so much in making exceptions in favour of industry-based apprentice training, but in improving its quality and its structural and organisational bases. This is, in fact, the common view. Apprenticeship must not be abolished but it requires modernisation. In a report published in France in 1966, the Committee on the Craft Trades and Artisan Sector of the General Commissariat of the Plan recognised that there were special difficulties connected with the rural artisan trades, but felt that several measures could be taken immediately to improve apprenticeship in the artisan trades as a whole. These measures included: establishing a joint service for co-ordinating basic and further training activities and for pooling available staff, training facilities and research studies; extending the related instruction to 8 hours per week, or 240 hours per year; improving the grants and allowances system; increasing the number of inspectors so as to strengthen the supervision of training; expanding vocational guidance services and organising short courses in teaching techniques for new apprentice masters; substantially expanding the facilities available for further training (190).

Current thinking in Italy shows what might be called an indirect decision to postpone action in the apprentice training field, to relegate it to a very subordinate position. In the guidelines issued by the Ministry of Education for implementation of the multi-annual plan for expanding and developing the school system, it was estimated that in 1969-1970, of all children leaving middle school: 32% would go into full-time training at a vocational school, 56% into secondary education institutions and 12% into vocational training other than a full-time vocational school programme, i.e. into apprenticeship or miscellaneous vocational courses (191). Even the Federation of Chambers of Commerce, Industry and Agriculture, in its report on an inquiry into the reorganisation of vocational training and apprenticeship, considered that, with one or two exceptions, apprenticeship is at present less appropriate than training given entirely in a vocational school or centre. According to the Federation, if apprenticeship is to become an acceptable form of training at all there must be a substantial increase in the number of plant and inter-plant training schools and centres and a considerable improvement in the quality of the related instruction classes (88). While everybody agrees, however, that reforms must be introduced, and government services, trade unions and educationists alike have tried their hand at drafting new legislation or proposing amendments, little progress has actually been made in introducing the improvements desired. One of the main obstacles may in fact be the problem of establishing the respective fields of competence of the ministries concerned in a situation where the dividing line between education and training is becoming more and more blurred.

In New Zealand the government's reaction to the decline in the apprenticeship intake was to institute the new inquiry into vocational training, already mentioned above (130). After two years' investigations the Commission of Inquiry published its report at the end of 1965, expressed general satisfaction with the system as such but recommended certain changes of emphasis. Measures needed to be taken to enhance the status of apprentice training (e.g. revision of apprentice wage scales), to improve the selection process, and to raise the quality of training by encouraging the use of trade examinations. There should be a central organisation for collecting and analysing data on employment in all the occupations for which training is required, for forecasting probable needs for trained men and women in each occupation and sector of economic activity, and for recommending the subsequent training action required. Greater attention should be given to the organisation of training for commerce, for which some system of certification should be introduced to make commercial training comparable to training in other fields. There was a need for rethinking the situation as regards training of operatives. Even with automation, modern industry still includes many repetitive tasks requiring a low level of skill; but skills at this level do need some training because of the increasing complexity of the machines and the high degree of uniformity required in their output.

In the United States, with apprenticeship enrolments dropping right through the 1950s, the President set up a " task force " to consider possible incentives for stimulating apprentice training in industry (193). Its report, published in 1964, concluded in favour of a system of federal tax credit applicable strictly to apprenticeship, pre-apprenticeship closely linked to employment for apprenticeship, and journeyman trade extension courses. The government, however, should not have final control over the number of apprentices to be employed and the applicants to be selected, nor should it be able to force industry to invent apprentice jobs in order to reduce unemployment. An industry should retain effective control of apprenticeship and training, following standards jointly approved by management, labour and the government.

As already indicated, however, apprenticeship is not the chief means of acquiring trade qualifications in the USA. From this derives the importance of the passing of the Vocational Education Act in 1963, with its accompanying vast credits for federal assistance for the expansion of vocational education (37). An interesting innovation of the Act is the institution of the " work-study programme " to provide part-time employment for young persons who need to earn in order to continue their vocational training on a full-time basis. As reported in the relevant abstract, to qualify for federal support under the Act a work-study programme for vocational education students must be supplementary to an approved state vocational education plan. The payments allowable are intended for students who (a) have been accepted for enrolment as full-time students in a vocational education programme, (b) need the earnings from such employment in order to commence or continue their vocational education programme, and (c) are between 15 and 21 years of age at the commencement of the employment. A student must also be capable, in the opinion of the appropriate school authorities, of maintaining a good standing in his vocational education programme while employed. The employment authorised under the " work-study programme " must be for the local educational agency or for some other public agency or institution, and must not exceed 15 hours a week during class sessions. The compensation allowable may not normally exceed $45 in any month, or $350 in any academic year.

It could easily be argued that such a programme is in effect a variation—or modernisation—of traditional apprenticeship.

The whole discussion on the reform of vocational training in the Federal Republic of Germany hinges on two themes: the need for achieving greater effectiveness in training and the need for comprehensive federal legislation to regulate it, already discussed above.

A resolution adopted by representatives of the German Association of Vocational Teachers at a conference meeting in Hanover in May 1964, listed 10 points on which agreement should be reached [see cut]. Most of their demands are merely statements of the situation as it already exists, but they also contain some important innovations (194). The ideas that there should be basic vocational training in a school situation at the start of an apprenticeship, that there should be at least 12 hours of related instruction per week (instead of the current norm of 8 hours), that there should be intermediate practical tests, and that the vocational schools should have an active part in conducting the final examinations, have given rise to considerable and sometimes heated discussion. Such a substantial increase in the amount of time devoted to related instruction would be detrimental to the quality of the practical training. A year of compulsory basic vocational instruction in school after completion of primary education was sound but could not be implemented: there was too acute a shortage of school premises and teachers; it would involve an additional dispersal of education, would extend the duration of training and possibly be prejudicial to in-plant training (195, 196). Both recommendations were taken up again, however, by the National Committee on Education in its recommendations on the second cycle of primary education, with particular reference to vocational training and vocational schools (197).

German Association of Vocational Teachers

Resolution concerning the reform of vocational training, May 1964

1. **The minimum age for starting vocational training should be 16.**
2. **All young people should receive basic vocational training and their aptitudes should be tested.**
3. **Systematic basic vocational training should result in shortening the duration of training on the job.**
4. **The duration of vocational training should be variable but in no case should exceed three years.**
5. **Related, part-time theoretical instruction in a vocational school should be compulsory for all young people.**
6. **There should be at least 12 hours of related instruction per week.**
7. **There should be intermediate practical tests which might entail prolongation of training in individual cases.**
8. **Vocational education and business should co-operate in organising final examinations, the theoretical part being conducted by the vocational schools.**
9. **Adult training should be encouraged.**
10. **Facilities for further training should be created.**

Training by stages

One of the newest measures recommended with a view to improving the effectiveness of training within the undertaking is known as " training by stages ". The system has been developed in the Federal Republic of Germany within the last four years as a measure to increase the flexibility of vocational training. It usually comprises three stages, corresponding to the three years of apprenticeship, and postpones final decision as to trade specialisation until the trainee has completed an initial period of basic training, common to a number of trades within a given occupational group. The first and the second stages take place mainly in a training workshop; the third stage is the real specialisation period in production.

The initiator of the plan, and its many supporters, point to the system's numerous advantages: broader-based training during the early stages, greater mobility of labour and increased flexibility with regard to changing from one specialisation to another while yet remaining within the same occupational group, a longer orientation period leading to a better final selection of trade or occupation, avoidance of premature specialisation. With passage from one stage to another dependent on agreement between the employer and the apprentice in the light of training results, and not on a final examination at the end of the stage, fear of a failure in an examination should in due course be totally eliminated. Organisationally it would make it easier to group apprentices to form special subject classes, in itself a measure likely to improve the quality of training. It would also inevitably create some difficulties however, particularly with respect to its implications for vocational schools.

Considerable interest has been aroused by the training-by-stages system and a number of abstracts have been published on it. There have been descriptions of the original plan put forward by its promoter—the Krause Plan—and of the schemes instituted, for instance, at the Krupp factories and IG Metall, as well as numerous abstracts on the comments, favourable and adverse, to which it has given rise (198-204, and passim).

As a system, training by stages is by no means limited to the Federal Republic in its application. References to its possibilities and weaknesses are to be found with respect to other countries as well, the USSR in particular. In February 1966 the Council of Ministers' State Committee for Vocational and Technical Training approved a number of principles applicable to the organisation of training within the undertaking following the training-by-stages system. For mechanical engineering, three stages were recommended: the first stage (6 months) leading to qualification as a first category worker, the second stage to the second and third categories (4-5 months) and the third stage for access to the higher categories (205). Early references to the system were not always positive in the USSR. The idea of a simultaneous progression of skills and of promotion to a higher category for all the workers taking further training by stages was declared to be " basically unsound ". Moreover, it was feared that the work at the plant would be disorganised if too many production workers were taught a second trade even though it might be related to their initial training (206). Less than a year later, however, the same journal carried another article describing a training-by-stages scheme in a Leningrad mechanical engineering firm which, on the basis of two years' operation, was declared to be an effective means of acquiring further training and much appreciated by the workers who attended the courses in ever-increasing numbers (207).

The industry-by-industry approach

A Russian article on the recommendations of the Council of Ministers' State Committee for Vocational and Technical Training respecting the organisation of training by stages states that 80% of the industrial workers in the USSR have received their training within an undertaking. It also states emphatically that whatever form of training (in-plant or school-based) workers may have had for the first four categories of qualification, only training within the undertaking can be satisfactory for the fifth and sixth categories. No training school or centre, it suggests, is or ever will be able to provide the broad, advanced training needed for these two categories (205).

These views might have been written of and in the United Kingdom. Yet even in this staunch supporter of the traditional type of apprenticeship, where the strictest laissez-faire policy has been observed and where all apprentice training has been regulated by collective agreement, the 1960s have seen radical changes in the organisational structure of vocational training, if not so much, as yet, in its content.

Once the initial decision for government intervention had been taken, chronologically things moved fast. In December 1962 the government published a White Paper on industrial training. In November 1963, after some 11 months of discussion in committees and conferences, in educational, employer and trade union circles, in professional bodies, in Parliament and in the press, the Minister of Labour placed the industrial training Bill before Parliament. Four months later, with very little amendment to the original text, the Bill had become law (208-216).

Compared to legislation passed in other countries, the Industrial Training Act may seem skeletal. It has nevertheless become a landmark in vocational training in the British Isles. It recognised the need for government intervention in training matters. It set up a central organisational structure for the promotion, supervision and control of training—the industrial training boards and the Central Training Council. It introduced a levy system for the financing of training, with a view to spreading the costs more evenly among the employers benefiting from it. It instituted a system of grants or loans out of public funds for the encouragement of training activities. It maintains the principle of the employers' responsibility for training but has given the government powers of compulsion to ensure that the training activities are properly conducted. In short, it concentrates immense powers in the hands of the Minister of Labour but at the same time leaves industry free to get on with the practical job of organising the training.

Structurally, one of the interesting features of the Act is the concept of organising training industry by industry instead of trade by trade. As a result of this decision, in April 1966, just two years after the Act became effective, 13 industrial training boards had been set up (wool, jute and flax – iron and steel – engineering – construction – shipbuilding – electricity supply – gas – water supply – ceramics, glass and mineral products – furniture and timber – carpet – man-made fibre producing – knitting, lace and net) and others were in the planning process (217).

Inevitably, with such a structure, it has not been feasible for the boards to keep pace with each other. In its first report to the Minister of Labour, the Central Training Council pointed out some of the problems of determining priorities in setting up the system. Each board, says the report, should cover as wide a sector of industry as possible, so as to reduce the number of boards and the administrative staff needed as well as to simplify co-ordination. The larger the sector the easier it is to cope with changes in technology and in market conditions. But such a policy means that some occupations will obviously be found in more than one industry. The Act allows for the establishment of joint committees in such cases and where appropriate (early on in the implementation of the Act, the engineering and the iron and steel industry training Boards agreed to set up a joint foundry training committee); but it is expected that, usually, informal arrangements for consultation will prove adequate (218).

Commercial and office training is another field for joint, nation-wide action. In November 1964 a special committee was set up to investigate and advise on training for commercial and clerical occupations, and has made extensive recommendations covering a wide range of occupations and branches of activity, including the distributive trades (219, 220).

Against these organisational and administrative problems, the approach probably has one advantage to offer. It allows an industry to plan and take action in the light of its own needs—a form of incentive to train which, backed by the financial incentives of the grants and awards and checked by the central, ministerial powers, it is hoped will pay dividends.

Training for adults

Most of the systems and organisational measures discussed above have been geared to providing basic training for young people and for the skilled worker level. Running right the way through them, however, it is evident that planning authorities, government services, employers, and workers' organisations alike are also concerned with the training and retraining of adults. It is not merely a question of organising retraining as an economic or social necessity, rather it is acceptance of the principles that training is a lifetime process and that further training and education are becoming an obligation, not merely a voluntary action. As indicated in a study on accelerated vocational training programmes for adults in four European countries—the United Kingdom, France, the Netherlands and Belgium—AVT, which originated in the desire to reintegrate unemployed and handicapped persons into the active labour force, has progressively become an integral part of a regional economic redevelopment policy (e.g. to promote the establishment of new undertakings in depressed areas), or a selective emigration policy (221).

Even though further education and training are implicit in the general systems for education and training, therefore, a number of countries have felt it necessary to reinforce this action through measures specifically intended to promote and expand vocational training programmes for adults. The Danish law for the training of unskilled and semi-skilled workers in employment is a case in point (99-101). Parallel action has evolved in Norway where a report to Parliament by the Ministry of Labour anticipated raising the yearly participation in government-sponsored adult vocational training courses to between 12,000 and 15,000 participants (the figure for 1963-64 was 5,500) over the next five years (222). Proposals by the Norwegian Minister of Education on the same subject declared, among other things, that adult training should be given the same status as youth training, and called for expansion of facilities for further training and education, a more flexible approach to certification on the basis of part-time courses, expansion and increase in the state grants and allowances payable for and to persons taking such training, and the establishment of a joint committee to advise on the organisation and co-ordination of adult training. The membership of the latter should comprise representatives of the Joint Education Council, the Manpower Directorate, the General Confederation of Trade Unions and the Employers' Confederation (223). A little more than a year later most of the proposals of both ministries were embodied in the regulations approved by Parliament regarding the status, tasks and functions of the Council for the Vocational Training of Adults (224).

Much the same type of action has developed in Poland. A scheme for promoting adult education through part-time courses of basic and further training for workers, was drafted by a committee of the Trade Union's Central Board in 1963 recommending, among other things, the creation, within industrial undertakings, of centres for the general and vocational training of workers (225). Two years later, in agreement with the Central Committee of Trade Unions, the Council of Ministers introduced a series of measures on the subject. Further training was considered to comprise (i) upgrading and/or training for promotion, and (ii) updating. Four types of programme were recognised (full-time or part-time vocational courses—normally between 30 and 600 hours of instruction; seminars; periods of planned employment organised for training purposes in a suitable plant; supervised self-instruction); further training was to be compulsory for certain workers (those employed in branches of economic activity where the pace of technical development and change warrant it), and was to be organised in conjunction with annual or long-term economic development programmes (226).

Few countries have gone so far as to declare further training compulsory for certain trades or occupational fields, however. Action has most often been directed towards measures to encourage participation in courses of further training and education or to promote the institution of appropriate training facilities for adults. In Belgium, for instance, a decree issued in July 1963 introduced further education allowances for young workers wishing to attend advanced courses in general or social subjects (35). Similar grants and allowances were approved by regulations issued in 1963 in the Federal Republic of Germany (145). The same year saw the establishment (by decree) of the National Adult Training Institute in France (227). A similar institute was set up in Algeria in 1967 (228).

In Spain a separate Department of Further Education was set up within the Ministry of Labour in November 1962 with wide functions " for co-ordinating, promoting and encouraging public and private vocational training activities; for advising training centres (possibly deciding their location, nature and size); and for establishing and managing public centres set up for providing further training" (229). The Ministry of Labour subsequently launched a comprehensive workers' occupational upgrading programme, with a planned output of some 750,000 persons having completed some form of training course between 1964 and 1967, and the construction of a network of basic centres (one per province) and local centres and mobile instruction units to reach workers in outlying districts (230).

In the USSR and the other countries of Eastern Europe, and in particular in Eastern Germany, part-time training of adults for purposes of upgrading and promotion has always been encouraged and regarded as part of the normal educational process. In the latter country, following an Order of the Council of Ministers (1960), the planning of adult training has been integrated into a comprehensive scheme of interrelated stages of qualification (231). In the USSR undertakings are required by law to provide further training facilities for their workers. Their obligations are defined in a series of official texts and regulations, but they carry, too, a right (subject to the consent of the worker's union) to dismiss a worker who refuses to learn a second (related) trade when the knowledge of such a trade is essential to the proper performance of this basic job. Collective agreements specify the number of persons for whom further training is to be provided, as well as the nature of the training and its duration (232).

Vocational training for adults, whether integrated in the national education and training system or distinct from it, is in fact becoming a permanent tool for social advancement and economic growth. As indicated in a 3-year statement on the vocational training activities of the Department for Youth, Sports and Social Affairs in Tunisia, the apprenticeship system cannot cater for all school drop-outs but the adult vocational training system has a relatively larger intake capacity, owing to its intensive training methods, and can adapt more easily to the different educational levels of such trainees (233). It is certainly this same ability of vocational training programmes for adults to provide the flexibility needed by their economic development plans, which has led many other countries in Asia, Africa and Latin America—as in Chile—formally to include them in their national manpower development plans (234).

Planning and co-ordination

The increasing complexity of national systems of education and training and the recognition of their interdependence have led most countries either to institute a single authority with responsibility for all education and training activities, or to include in their organisational structure permanent machinery for co-ordination of the different component parts. The latter is perhaps particularly noticeable in the developing countries where there is special need for planned and simultaneous development and where the existing institutions are still relatively new. It is often easier to start recognising the need for newly created services to co-ordinate their activities than to convince long-established bodies they can benefit from collaboration with services which may even seem, on the face of it, to be working in opposition.

Both these trends are reflected in the abstracts. Typical of the central planning trend is the new organic law on education promulgated in Honduras in 1967 which specifies that, for the effective performance of its functions the Department of Education shall have separate services for "pre-school education, primary education, general secondary education, technical and vocational education, teacher training, art education and cultural development, adult literacy and education, sports, and school buildings." Each of these services, however, must follow the decisions of the Office of Over-all Educational Planning, which shall itself work in collaboration with the Economic Planning Board (127).

Whatever the title given to the co-ordinating body set up within a country, its functions and composition follow the same general lines. The list of such bodies, even of those noted in the abstracts, would be long. Their composition is likely to include, as in the case of the National Advisory Centre on Technical Education and Vocational Training in the Central African Republic (235) the minister of labour and social affairs and the minister of education (respectively chairman and vice-chairman), the minister or official responsible for the economic development plan, the ministers of public works, of agriculture, and of national defence, the heads of the educational bodies directly concerned and a specified (equal) number of representatives of employers' and workers' organisations. The Supreme Central Consultative Committee set up by the Iraq Ministry of Education is another example (236).

Representation of the national planning department is becoming a permanent feature. But more direct contact with current manpower and educational research activities is becoming even more important. Concern with maintaining such contact is to be seen in the establishment of such bodies as the Central Research Institute for Vocational Training in the Federal Republic of Germany (237), the Ministry of Labour's Manpower Research Unit in the United Kingdom, the US Education Research Information Center (238), set up by the Department of Education and intended to serve not only the Department but also the entire educational community. At national and at state and local levels, action must be based on accurate and up-to-date information on what is required of the system as a whole in numbers and in quality.

III. Vocational orientation, guidance and selection

The changing concepts of the objectives and organisation of education and training have created new problems for vocational orientation and guidance, as have the changing economic and social pressures discussed in Chapter I. But if they have raised problems they have also had a positive impact. Orientation and guidance services have gained tremendously in importance over the past few years. The individual is more aware of the need to exercise his choice of an occupation well, and to seek help in doing so; employers are more inclined than in the past to use more scientifically proved methods for selecting their employees.

Specifically, it is the general tendency to stay on longer at school, either on a voluntary basis or because of a formal prolongation of the period of compulsory schooling, and the concept of comprehensive or multi-purpose schools which, together, have had the greatest single impact. Postponement of the final decision for a trade or an occupational field, and the broader educational bases of the final years of compulsory education have expanded the range of occupational possibilities and rendered the work of the guidance counsellor more complex. An additional complication may be seen in the fairly general acceptance of the idea that vocational orientation and guidance are not actions which are needed only once in a lifetime. As stated in a resolution adopted at a meeting of experts convened by the International Vocational Guidance Association (IGVA) in 1963, there is a need for the child, adolescent or young adult to receive the individual assistance of a guidance counsellor at different stages of his development—from 10 or 11 years of age up to the age of 24 or 25 years (239). There are cases where it is felt that this period of need should be extended well beyond the 25 years age limit.

A Working Party on the functions and organisation of vocational guidance for adults and older persons, set up by the Swedish Vocational Guidance Association, noted the higher incidence of older persons seeking the aid of the guidance services and attributed it to the higher school-leaving age and the rapidly changing structure of the employment market. The continuing exodus from agriculture and forestry, the increasing number of women who re-enter the employment market after an absence of some years, and policies for the reintegration of handicapped workers into the labour force, have greatly increased the demands made on vocational guidance services and have made new specialisations within the general guidance field (240).

There has therefore been a move over the past decade or so to spread the span of vocational guidance and orientation both backwards into the primary school programme and forwards to come to the aid of the adult worker. It is perhaps indicative of this trend to note that in 1963 the International Vocational Guidance Association felt it necessary to change its title to become the International Association for Educational and Vocational Guidance in order to clarify its field of action. But the main effort is still, and likely to remain, concentrated on youth; the general concern is that of helping young people to cross over as smoothly as possible from full-time education to integration into the active labour force.

Orientation – guidance – selection

An article published in "La nouvelle Revue pédagogique" in 1962 warned against a tendency to confuse vocational guidance and vocational selection. The aim of selection was to choose from the mass a qualified minority for doing a specific job requiring specified qualifications; the purpose of vocational guidance was to enable every individual to find the place in the work force which corresponds best to his own aptitudes and the interests of society (241). To these two notions should be added the idea of vocational orientation: a stage which precedes the other two and is intended to give young people approaching school-leaving age a general understanding of the employment market, its opportunities and the career limitations implicit in the selection of different streams of education.

The orientation phase is further sub-divided into general orientation activities and practical orientation. The former are largely informational. The latter comprises short periods of practice and/or observation in several occupations. Its direct object is to acquaint persons about to enter employment with the nature and conditions of work in the occupation(s) in question so as to ensure a realistic approach to occupational choice.

Most countries have tried to meet the challenge of vocational guidance by taking advantage of the longer period of compulsory schooling to include systematic, planned observation and orientation sessions into the regular school programme. The prevocational and polytechnical training or education introduced in the USSR and other countries of Eastern Europe since 1958, and the observation and orientation cycles instituted with the French educational reforms—discussed in some detail in Chapter II—are cases in point.

Some countries which have followed the idea of polytechnical courses as a preparation for the transition from school to work, have seen it more as an independent activity, school-based but nevertheless outside the school system. This is the case with the recommendations for the organisation of a 9th year of compulsory education in Austria. The courses for the 9th year are to have standard syllabi, which must nevertheless be flexible enough to allow adjustment when necessary. Their aim is to give pupils who are neither attending a junior secondary or a higher school (whether general or technical, agricultural or vocational) nor staying in the lower or upper primary classes or a special school, general basic training with a view to their future careers. In other words, they are for youngsters who do not wish to prolong the ties with school. The instruction should therefore not be "bookish" in character and should avoid requiring much memory work of the pupils.

The curriculum would include instruction in such subjects as: rules of behaviour (including attitudes to work), mother tongue, mathematics, basic economic and social sciences, civics, economics, technical drawing, hygiene and home economics, and an initiation into practical work. Vocational guidance is to be reinforced by orientation visits to firms and exhibitions (242).

The same type of approach can be seen in the Federal Republic of Germany with the year of post-primary practical orientation organised jointly by the Christian Movement for Young People's Villages and Hibernia Limited, except that here the programme is more occupation-minded. The pupils spend three days a week on practical work and the remaining two at a vocational school (243). Another variation on the same theme is the institution of prevocational classes in Switzerland providing an optional year of continued education for young people who, on completing their compulsory education, are not sufficiently mature to make a valid occupational choice. The first such experiment was noted in the abstracts with respect to the canton of Aargau (244). The syllabus much resembles the programme recommended by the Austrian polytechnical commission. Later references deal with similar arrangements in Zurich and in the canton of Basel-Land (245, 246).

In all cases, however, there is the problem of how to make the orientation visit to work-places meaningful. How is it to become more than just an outing, an escape from the school routine? How is the school to determine the usefulness a visit to a given firm or undertaking can have for a particular group of pupils or class? What can be done to make the visit more effective, or to counteract attempts—whether intentional or involuntary—on the part of the employer to use the visit for recruitment purposes? These are some of the questions which are being asked by teachers and guidance specialists in all countries and schools which have instituted school and youth guidance services. Some of the answers are discussed in an article on research being carried out by the Vocational Guidance Research Unit of the Department of Psychology, Leeds University (247). They are also to be found in the background to the preparation of a model plan for the organisation of a vocational orientation visit, established as a demonstration project by the Vocational Guidance Office of the canton of Zurich, Switzerland (248).

Practical orientation through work experience

More recently there have been signs of a tendency to carry practical orientation one stage further, to enable the pupil to get, through personal work experience in selected occupations, a realistic idea of what the jobs and job environments entail. The abstracts do not as yet carry many references to such measures: they are probably at too experimental a stage for opinion to be formed as to their worth. In Sweden, such practical vocational orientation (PRYO) was made compulsory for all the 8th-year pupils in the new common basic school as from the 1965-1966 school year. It consists in organising work experience in two or three different jobs for each pupil for a total period of three weeks. Its goal, as stated in the school curriculum and reproduced in the relevant abstract, is to complement

> "the theoretical vocational orientation by making it possible for the pupils to get, through personal experience of working in selected occupations, a realistic

> idea of what the jobs and job environments of the occupations entail; the pupils get an opportunity of trying and finding out in actual work whether they possess the aptitudes, interests, etc., required for the occupations in question; it provides the pupils with better knowledge about working conditions, e.g. industrial organisation and specialisation, the relationship between employer and employees and between colleagues, training facilities, safety, and industrial hygiene."

Implementation of the scheme entails a tremendous amount of organisational work, and must have the full co-operation and comprehension of all parties concerned: parents, teachers, pupils, employers, the employees from whom the youngsters will get their information, the county school boards and county labour boards, the vocational guidance specialists (249). Not all the experiences have been successful. Subscribers to "Training for Progress" may recall an anecdote on the system which was published in Volume 4, No. 1, and highlights some of the problems raised.

The only other comparable examples noted come from the Federal Republic of Germany and the United Kingdom. In the Federal Republic an experiment was made to introduce a two-week practical training period in industry for 9th-year schoolchildren in Bielefeld, on which to base subsequent prevocational training and vocational guidance. The experiment seems to have been successful in that it makes counselling and placement in apprenticeship easier. But the article describing the experiment concludes that if this type of training period is to be introduced generally the vocational guidance offices will need much more staff (250).

The second case is a private scheme initiated by the headmaster of a British secondary school for boys, backed by the local town council and with the co-operation of local industry. It is one school's answer to the problems raised by the mass of boys staying on at school beyond the compulsory schooling period yet not having either the intention or the aptitude for higher education. It gives the boy a chance to acquire an industrial (or commercial) orientation and even to find his right level within the industrial structure (251).

Vocational guidance and manpower planning

The upsurge of interest in vocational orientation and guidance seems indicative of a need which may have been latent for some time. It is no accident that this interest should grow parallel to the swing towards the scientific, socio-economic approach to manpower planning and human resources development. Vocational guidance has gained recognition as a valuable adjunct, an essential tool of manpower planning. But a certain amount of conflict is apparent between national manpower needs and concern for the occupational preferences of the individual. It may sometimes be only a very fine line which separates genuine practical vocational orientation from attempts merely to direct young labour into useful channels of activity with known employment opportunities. Measures to combat the problem of the educated unemployed in India by encouraging them to embark on self-employment (144), and to eradicate the general aversion to manual work in many of the developing—as well as the more highly industrialised—countries, can be regarded as both economic planning and guidance of the individual into employment which will give him economic independence and self-respect.

The same may perhaps be said of the attempts being made in many countries, and particularly in Africa, to give rural youth prevocational training and to direct them towards local employment—agricultural and non-agricultural—in order to stem the drift away from the land. A number of such schemes are in operation experimentally, but only a few of them have been selected for discussion in the abstracts. Representative of this trend in the developing countries are the pre-apprenticeship centres in Tunisia (252), the Civic Service system in Mali (39) and the Young Pioneers Movement in the Central African Republic (42), all three of which have been instituted principally to teach improved husbandry techniques and to provide polyvalent training in common craft trades as a general preventive against the rural exodus, and the "back to the land movement" started as a campaign against unemployment in Dahomey (40). The action taken by the Madrid Provincial Chamber of Industry to institute "vocational initiation" courses to prepare primary school pupils for employment in various occupations available locally, and generally to promote the development of the Madrid hinterland, can be viewed in much the same light (96), although the problem is by no means as acute as in the countries just cited.

Concern over the need to direct young people into occupational fields in conformity with the needs of the economy is very apparent right through the abstracts. In discussing the trades or occupations to be taught in the then newly instituted practical training classes in the 11-year schools in the USSR, it is stated categorically that each pupil should, in principle, be able to choose his trade freely but that "the needs of the national economy, and more particularly of the economic areas concerned, in regard to skilled workers take priority" (253). In 1963 special vocational guidance programmes were established by the City of Dresden in Eastern Germany, with a view to directing pupils systematically towards an occupational choice in line with the needs of the economy (254). A community programme sponsored and administered by the local Chamber of Commerce in a small town in Massachusetts (USA) has as one of its guiding principles the need to direct young people towards training and employment opportunities available locally (255). The vocational guidance system evolved in Czechoslovakia links education and training with the state economic planning through a complex system of "apprenticeship balance sheets" which reveal differences between regional manpower needs and the numbers of young people available to fill them. The differences are then resolved by what is termed "inter-regional transfer of youth". When vocational guidance is so closely tied in with the needs of the economy, however, its psychological aspects run the risk of being forgotten. Fear of neglect of the individual in application of the plan has led a group of Czech psychologists to devise a scheme for redressing excessive emphasis on economic factors, a scheme which has now been operating in all Czech schools since 1963 (256).

The Czech research in this field is characteristic of a common trend: if vocational guidance services are tending to apply a more practical approach and to direct their counsellees (both young and adult) towards those fields and occupations where they are likely to find an economic return for their training and work, they are none the less deeply concerned with taking the occupational aspirations of the individual into account. This was defined at the IGVA meeting of experts in 1963 as implying assistance based upon knowledge of the young person, his needs and environment, within the framework of the economic situation in the country (239). At the same meeting it was stated that the school can be expected to help substantially in the evaluation of the individual problems of pupils and maladjusted children and to decide the different forms of assistance required. But in both the IGVA report and the Czech study referred to above, it is stressed that the guidance process is a joint affair involving, as appropriate in each local or national situation, the systematic co-operation of all concerned: the teachers and the guidance counsellor, the school doctor, psychologist and social welfare officer, the careers master, the youth employment service, the childrens' parents and their future employers.

The special groups

It can be argued that the greater attention being paid to individual assistance, and in particular to the problem groups—the elderly, the physically and socially handicapped, the maladjusted and the mentally backward—has been prompted by economic considerations. This is not entirely so. The tight employment markets of the past decade in industrialised countries have certainly given immense impetus to the visible change in attitude towards employment of these categories. Considerable progress has been made in achieving a better understanding of the employment implications of social and physical handicaps—and vocational guidance has risen to the occasion.

A certain number of the abstracts classified under this heading deal with guidance activities specially directed towards these disadvantaged groups. There are, for instance, references to the work of the vocational guidance centres in Belgium specialising in assistance to the adult unemployed with physical or mental handicaps (257); to a vocational guidance manual which has been prepared for teachers in the Federal Republic of Germany dealing with handicapped adolescents (29); to action taken to retrieve or reorient school dropouts in developing countries, and in Tunisia in particular (258). Special measures have been taken in the USA for the vocational preparation of mentally retarded young people (259) or for those who are physically or emotionally handicapped or otherwise socially disadvantaged (260, 261). In the Federal Republic of Germany, mentally retarded boys in the special classes of the common basic school are increasingly being oriented towards apprenticeship in certain of the craft trades, especially as house painters (262). The evidence shows clearly that the principles have been accepted and have even been carried far beyond the tight labour situation in which they evolved.

An inquiry into the work experience of handicapped children—children with poor eyesight, motor-handicaps, hearing defects, an epileptic condition or a mental handicap—has been carried out in Italy among pupils who left one of the five special schools for handicapped children in Milan. The aim was to assess the reliability of various factors in predicting satisfactory integration in working life on the basis of a detailed analysis of the medical, pyschological and social situations of the subjects. It was found that the occupations followed by these young handicapped people covered a wide range of jobs but showed little correlation with the vocational training acquired at school. It was concluded that educational and vocational guidance should constitute a single and continuous procedure and that close attention should be paid to psychological aspects in all rehabilitation work (263).

The vocational guidance counsellor is in a special and privileged position in the team trying to help such children. In some respects he is able to do more for, or learn more about the retarded or mentally disturbed child or adolescent than can the parents or teachers, a psychologist or psychiatrist. Psychotherapy in vocational guidance has its limitations however. Its value consists mainly in its ability to track down or suspect the real reasons for difficulties at school or in an apprenticeship, and in this way to help the psychologist or psychiatrist ~~to pre~~scribe the right treatment (264).

Methods, training and research

With recognition of the complexity and importance of the vocational counsellor's job has come concern for giving him adequate preparation for performing it. Guidance counsellor preparation is tending to include more study of psychology, to emphasise the need to have an understanding of personality dynamics and motivation, as well as updating in new teaching media, assessment devices and techniques. An American article adds that the employment counsellor today must also consciously and deliberately think in terms of change and keep up to date on new and expanding occupational fields (265). He must learn to present information at the right moment. He does not, according to a Swiss article published in 1965, need to be a trained psychologist but he does need to have had sufficient training in psychology to be able to discuss and stimulate discussion with adolescents and their parents (266). On the whole, however, the counsellor's role and functions are not very well defined. A survey carried out in area vocational-technical schools in five states in the USA reached the conclusion that it was impossible to draw up generally applicable descriptions for either (267).

Aptitudes and potential for success

More recently, judging by the abstracts, the bulk of the research in this field has been on the assessment of pupil potential and aptitude and on testing the effectiveness of counselling practices under certain conditions. Assessment has been moving away from the rather narrow concepts of using tests and aptitude batteries for determining success potential. Even the concepts of success have been changing. In addition to long-accepted external success criteria in employment—earnings, output, stability in employment—there are other measures to be applied, such as the individual's career satisfaction (268). Administration of a test battery alone is not enough; it must be backed up by other and broader types of information—health and physical factors, school results and home environment—and by extensive depth interviews.

Occupational choice

Vocational guidance seems, in fact, to be at a new beginning. Much that is written today on the subject is exploratory or experimental in character. Conclusions are still only tentative. The lines of research are interesting in themselves. One of the more prevalent themes is the type of factor influencing occupational choice, and a number of projects to ascertain the motivations of occupational choice have been noted in the abstracts, among them:

— an inquiry in the USA to determine the occupational preferences and expectations of girls in relation to the occupational level of their parents (269);

— a study in Eastern Germany to show whether their practical work classes had had an effect on the girls who chose a technical occupation on leaving school (270);

— a French inquiry to determine the influence of aptitudes on adolescents' inclinations as regards occupational choice (271);

- two Italian studies, one on the pattern of occupational choice during training (272) and the other on occupational choice and economic planning (273);
- a series of studies in the USSR on subjects such as the occupational interests of schoolchildren (274), the motives underlying occupational choice (275), the psycho-sociological factors connected with development of an interest in a trade (276);
- a doctoral thesis by a Swiss psychologist and guidance counsellor on the possibilities of predicting occupational choice on the basis of Kuder questionnaires and the General Aptitude Test Battery (277).

Other interesting fields for research have been the expectations of young job applicants in France (278); the career histories of trained and untrained US secondary school graduates, assessed eleven years after graduating (279); the relationships between school results, vocational aptitudes and performance at work studied among apprentices in a German metalworks (280); the attitude of apprentices towards their trade and their choice of trade and subsequent disappointment in the working environment, a preliminary study undertaken by the Institute of Pedagogical Research at Bratislava in Czechoslovakia (281).

A general increase of interest in a research approach to problems and possibilities of vocational guidance is apparent. These studies are tangible evidence that less faith is placed in intuitive counselling. Judgement is still a key element in the counsellor's qualifications, but it needs to be backed by hard verifiable data. Perhaps it is not surprising to find, in view of this trend, that in the USA there has been experimentation to devise, develop and test a computer-based system of vocational guidance—autocoun—to offset weaknesses in the human element. The object of the exercise was to try to simulate good counsellor behaviour on a computer system and then compare the outcomes of the computer with those obtained by a "real" counsellor. The machine system agreed with the human counsellors on approximately 75% of the student appraisal statements and about 65% of the course selections. But the human element is still to be reckoned with: nearly all students were more positive towards the human counselling system. Automated counselling is not for tomorrow (282).

IV. Supervisors and technicians

Supervisory training, more than any other single sector of the training field, has been going through a period of assessment. Little that is really new has been added to the training programmes. Instead, there has been a fairly common trend to look backwards at the product of past activities and policies—the multitude of supervisory training programmes—and to ask whether the latter are really fulfilling their purpose. This is not to say that the period has been one of stagnation, but rather that there is a general demand for a more informed and flexible approach to supervisory problems, for assessing the present position before going on to another stage in the game. By and large, the supervisory problems themselves fall into two main categories: one professional—the role of the supervisor or the content of his job; the other personal—the supervisor's status, in society in general just as much as at his place of work.

Role confusion in supervision

All research programmes and evaluation projects in the supervisory training field tend to begin by stressing how difficult it is to define the role and functions of a supervisor. The CIRF evaluation study, published in "Training for Progress" in 1965, is no exception to the rule (283). From the abstracts it is abundantly clear that the job of the supervisor cannot be thought of as in any way standardised and that the indiscriminate application of simple standard programmes may lead to failure and waste.

Supervisory effectiveness usually depends upon a multiplicity of factors: the particular situation, the supervisor and the organisation in a complex interaction. Role confusion on the part of supervisors is mentioned frequently in the abstracts, though it may not always be referred to in precisely those words. An abstract of a Belgian article states that "The supervisors' role as part of management leads to a personal conflict of duties. Their indisputable loyalty to the undertaking clashes with their understanding for the needs and desires of their subordinates." (284). Most often, as shown in one of a series of articles in an American reportage on the status, role and functions of the supervisor in industry, their position is felt to be that of the "man in the middle", between management and workers and not clearly a part of either (285).

The problem crops up again in the supervisor's relationship with staff specialists of one kind or another. An abstract describing the supervisory training system and principles adopted by a large tyre manufacturing company in the United Kingdom provides a rather typical comment illustrating it: "The growing influx of specialists to advise the decision taker, the manager, has led to confusion and to an undermining of confidence at the foreman level. The foreman, although part of management, has developed doubts about his right or ability to make decisions" (286). A study of the situation of promoted foremen in the USA reached similar conclusions (287): while the pressures from staff specialists were certainly likely to be severe, the greatest difficulty encountered by the supervisor in adjusting to his new job was his lack of understanding of the responsibilities he had assumed.

The confusion is not all on the one side, however. Supervisors often feel a lack of support and interest on the part of top management—the existence of a very real gulf between them. All too often, as pointed out in a study by a group of personnel specialists in the United Kingdom, managements do not understand that, although the supervisor implements rather than initiates management policy, he should nevertheless participate in the formative stages of policy making and be treated as a member of the management team as to status and privileges (288). Instead, the study goes on, the supervisor plays an "ambivalent role", identifying himself sometimes with the shop floor and sometimes with management.

It is probably impossible to over-estimate, therefore, the importance of good liaison between management and supervision as a means of eliminating the role confusion problem. Sometimes, as shown in a project to assess the effectiveness of a supervisory training course in changing supervisors' attitudes towards management, action to effect a change of attitude is rendered useless for want of parallel and simultaneous action directed towards the other parties concerned. In this particular case, a course was run by outside consultants for a firm employing some 1,500 persons:

> "Prior to the course the supervisors had had no clear conception or expectations of the role of management. The consultant only succeeded in changing the supervisors' attitudes; he failed to bring about the necessary changes in senior management, despite a training course for management aimed at inducing such change. After waiting several months for a change, the supervisors became discontented and hostile to senior management, although their material claims had been fulfilled. As a result 45 per cent. of the supervisors, among them nearly all the best qualified, left, or attempted to leave, the undertaking within the year" (289).

The importance of this intangible, role confidence factor in effective supervision was implied in one of the earliest abstracts in volume 1, which can still be said to represent a concise summary of latest thinking. In essence, the article pointed out that supervisors of high production are those who are under little supervision from their own supervisor, place little direct emphasis on output, encourage employee participation in decision making, spend much of their time on human relations, have greater confidence in their supervisory roles and generally feel they know where they stand in relation to the undertaking (290).

The skills in the job

As the role of the supervisor cannot be regarded as standardised so, too, his functions and the content of his job escape definition and of necessity remain largely individual. There are nevertheless recurring qualities and skills which are common to all posts of this category. Nearly all the abstracts describing or assessing supervisory training programmes, for instance, refer to written and verbal skills as a prime necessity. It may be called communication skill or language development, public speaking or mother tongue training, or something else again, but the intent remains the same: improvement of ability to convey ideas. Courses prepared by the German Chambers of Industry and Commerce (291) or run by the iron and steel industries of France (292), Sweden (293) and the United Kingdom (294), in-plant training programmes for foremen in France (295) and in a large motorworks in the United Kingdom (296), and training organised for farm foremen in California, USA (297), and for mastercraftsmen with instructing duties in Eastern Germany (298), all devote considerable time to improving the supervisor's ability to communicate with both his superiors and his subordinates.

In a syllabus outline for a 30-week programme recommended by the United Kingdom Institute of Industrial Supervisors (299), instruction in communication skills (22½ hours) came second only to human relations (30 hours). At the Oxelösund steelworks (Sweden) mother tongue training was at least as important, in class hours, as physics, draughting, chemistry and special supervisory techniques training (each of which comprised 30 hours). Only mathematics was given substantially longer (60 hours) in the 235-hour programme (293).

Behavioural patterns

The problem of communication affects other aspects of the supervisor's job. What may be variously called human relations, appreciation of human factors, man management, leadership, and labour relations all depend upon communication skills for successful performance. It is not surprising, therefore, that parallel to the expressed need for communication skills is a similar expression of need for skill in the human relations field. Most of the programmes already referred to deliberately set out not to teach technical production aspects of the works but to assist the supervisor to improve his leadership skills.

At first sight it would appear from the abstracts that behavioural patterns and human relations problems are less to the fore in supervisor development in the countries of Eastern Europe. The training available to supervisors at the Polish technical colleges (300) and the curricula at the training schools for supervisors in the Ukraine (301) and different regions of the USSR (302, 303) tend to be concerned chiefly with providing basic education and courses for improving their technical skills.

Such a conclusion would be ill-founded. The USSR articles and documents contain frequent references to the education and organisation functions of supervisors—and such responsibilities certainly imply considerable interest in and concern with human relations. Educating the workers is one of the main purposes for which the Councils of Foremen system was instituted in 1963 in certain towns and areas of the Russian Federation (304). An article published towards the end of 1963 described the greater authority and responsibility being given to industrial foremen in the Leningrad region. "Undertakings", says the relevant abstract, "are increasingly handing over economic functions to their foremen, who have the advantage of possessing practical experience and above all of knowing the capacities of the workers. The foreman should not, however, think exclusively in terms of production; he must also consider the human factor, for the key to productivity is a good team spirit" (305).

Moreover, an article on the expansion and development of the evening schools for supervisors reports that changes to be introduced in 1967 in the curricula included a reduction of the time given over previously to technical subjects, with the 216 hours saved being added to the instruction in more general subjects (306).

Action trends and methods

Two major lines of supervisory training development are apparent in the abstracts. They correspond to the role and functions concepts discussed above. One can be characterised as the complex having to do with the human side of enterprise—human relations, communications, economics, management theory, organisational factors such as staff relations, company goals, industrial safety and hygiene, and worker training and development.

The second line is the technical training complex, which includes everything from basic arithmetic to physics and chemistry and, of course, specific training in the technical aspects of the product and in the general techniques of business management. Also frequently included under "technical training" are broader areas such as languages, draughting, production planning, cost control, work study, operations analysis.

By and large, the training falling into the second category tends to follow conventional classroom methods. It may be given during working hours or outside them, in the evenings or other spare time periods. The programmes established for the training schools for supervisors in the Ukraine (301) and the Ural (302) are fairly typical of this type of training in Eastern Europe. In both cases training lasts three years. The programme approved in 1962 for the former provided for two years of general education followed by a third year of combined general and technical education—industrial drawing, general mechanics, electrotechnics, metallography, automation, instruction in the economics and organisation of production based on direct output and costing data supplied by the plants. The general objective of the similar schools set up two or three years later in the Ural was slightly different and the organisation of the school programme differs accordingly. The trainees follow general and technical subjects simultaneously. General education predominates (1,404 hours); technical education takes up 540 hours (trade theory – 360; technology, technical drawing, work organisation and economic aspects of production management – 180). In addition, there are 216 hours for tutorials or consultations with teachers and instructors.

It is interesting to compare these two programmes with two course outlines for in-school training for supervisors in the Federal Republic of Germany (291) and for ceramics foremen in Sweden (307). The former is a model course proposed by the Chambers of Industry and Commerce for preparing supervisors for the industrial supervisor examination. It comprises 720 hours of part-time study, normally spread over two years. Divided into three equal parts, it covers successively (i) German, arithmetic, physics and chemistry, (ii) the technology of the relevant branch of industry, (iii) business administration and organisation and human relations. At the residential school for ceramics foremen at Höganäs, in Sweden, a general, two-term course comprises 728 lessons covering the following subjects:

	No. of hours
shop mathematics	40
shop drawing	30
ceramics design	15
ceramic materials	13
general materials	10
ceramics production techniques (general)	120
ceramics control and testing methods	16
ceramics products	15
production mechanics	14
measuring techniques and instruments	15
production organisation and economics	21
rationalisation techniques	10
training techniques, methods, principles	6
laboratory work	12
practical work	320
study tours	28

Methods adapted to the human complex

Much more variety and imagination are evident in the training aiming at preparing the supervisor for his human relations and related supervisory functions. Methods such as role playing, unstructured conferences, discussion groups and case study are all used in an effort to teach good human relations principles and techniques and leadership. Individually these methods are not new, however, and few references or studies on them have been substantial enough for inclusion in the abstracts. But there is a new, more adventurous approach to their utilisation. Fairly typical of such approaches is the method described in an article on an experimental programme for training first-line and second-line supervisors employed by the Electric Power Commission of New Brunswick, Canada. The experiment adopted a behavioural approach: the objective was to "unfreeze" existing attitudes and patterns and to replace them by new attitudes reinforced and subsequently "refrozen" through practical application. The methods employed were the case method and training groups that engaged in relatively unstructured discussion (308).

The need to know more

A very early article in the abstracts collection said that little was known about the effectiveness of supervisory training (288). This basically is still true, but it is safe to say that quite a bit more is known today about the relative effectiveness of different types of supervisory training programme and the methods which can be used to assess them. There have been, during the past six years, as indicated at the beginning of this chapter, a number of formal or semi-official projects to assess the present position of supervisory training, as a whole or within a given sector of industry.

In 1964 a committee was appointed in Ireland to examine the adequacy of standards of supervision of operatives in industry. Its report, published in 1966, made a number of policy recommendations for basic and further training in supervisory functions (309). It was in 1964, too, that the Committee on the Selection and Training of Supervisors was reconvened by the British Ministry of Labour to consider progress since publication of the Committee's report two years earlier (310). With the wave of inquiries that accompanied and followed the passage of the Industrial Training Act of 1964, it was inevitable that supervisory training should come in for its share of the limelight and, in fact, the newly established Central Training Council soon issued a booklet on recommended policies and practices (311).

But by far the most interesting action and far-reaching thinking are to be found in the inquiries, experiments and research projects carried out during the period under review on an industry-wide basis, by large industrial firms or groups of firms, or by specialists in supervisory training. In general, such inquiries have been working along three lines.

1. The supervisor function

It is clear from the abstracts that what is wanted in supervision are well-rounded people who not merely have a good technical grounding but also possess human relations skills. And over and above this they must have had a training that has been broad enough to make them adaptable to change. An abstract of a French article expresses this need as follows:

> "Heads of undertakings and training specialists want future managers to be young and polyvalent; they cannot however gauge their exact requirements in 5 years' time due to the rapidity of technological development and the unforeseeable trends in the industrial set-up. The young managerial staff of tomorrow will need intensive training in the field chosen and intellectual flexibility in order to adjust rapidly to new conditions and to possible job changes. Polyvalency of skills and knowledge will give them the necessary adaptability and efficiency in most circumstances, as well as facilitating their possible need for retraining" (312).

From the USA comes a report of a field study in which supervisory jobs in 11 plants were redesigned in various ways using experimental and control groups, the intent being to find an optimal design as regards authority and responsibility and to determine the effects upon product, cost and quality. In the light of the discussion above concerning the supervisor's general insecurity about his role and identity, the author's recommendations are not surprising: (a) "the design of a supervisor's job should aim at including authority and responsibility for all the functions required to complete the product or service assigned to his work group, including quality acceptance", and (b) "on the basis of the results of this and previous studies, responsibility and authority for work functions should be delegated to the lowest organisational level performing the work" (313). If these findings are adopted as working principles, the training implications become highly significant. Delegation of this type means that supervisors will need training in the broadest possible sense since they will be called upon to "manage" their unit.

2. The place and content of training

An abstract summarising a 40-page survey of current American thinking on the status, functions, recruitment and training of supervisors points out that, despite the enormous variety of techniques used in supervisory training, there are basically only two schools of thought on how the training of supervisors should be organised: through trial and error on the job, or in a classroom situation. Each method of approach has drawbacks: in the trial and error system "the learning process will probably be long and the errors too expensive"; in the classroom "the supervisor's mistakes will be less expensive, but it will be impossible to create artificially the pressures and the practical components of the work situation" (285). Somewhat the same views are to be found in an abstract on the policies of the recently established (1964) National Examinations Board in Supervisory Studies (NEBSS) in the United Kingdom (314) and the discussion to which they have given rise (315-317). There seems to be a consensus that there is need for broadly based training utilising both approaches.

There seems also to be general agreement that, while main responsibility should rest with the firm, there are situations which demand off-the-job training outside the company. There are several examples of major industries setting up complex systems and comprehensive centres for supervisor and technician training: the iron and steel industries in France (292), the Federal Republic of Germany (318), Sweden (293) and the United Kingdom (319), the combined power stations (320) and the chemical industries (321) in the Federal Republic of Germany. Perhaps it is no accident that four of this short list should be for the same industry. In all four countries, the iron and steel industry is large and highly organised; it is also an industry where training on the job is becoming more and more difficult to organise in view of the extremely rapid technical change which is taking place.

Three other abstracts coming from the United Kingdom—the recommendations of the Iron and Steel Industry Training Board, the Engineering Industry Training Board and the Central Training Council (319, 322, 311)—illustrate very well certain new trends in supervisory training. The iron and steel industry recommends three things: that a line manager must hold full responsibility for training his subordinates; that more attention must be given to job specific training; that, wherever possible, training requirements should be met within the firm. This approach is paralleled in some respects by the Engineering Industry Training Board with its recommendations for a 4-stage approach to a more individualised preparation for supervision: job description and successive determination of training needs specification and methods—the latter being classified as on-the-job instruction, secondment to other departments, off-the-job training within the company and off-the-job training outside the company. Finally, the Central Training Council makes a strong case for in-plant training and places responsibility firmly on management. It adds, however, an important dimension by introducing the idea of the need for a dialogue between supervisor and management about training. Training on the job is an integral part of supervisory training and must be done by the supervisor's line manager. This informal training in the work situation should be reinforced by group discussion meetings, and such formal course instruction as the analysis may have shown to be necessary. Well handled, this approach will lead supervisors to define their own training needs, and the interchange of training ideas between supervisors and management will then become a two-way exchange.

It is interesting to note how closely these ideas parallel the essential features of American supervisory training programmes, such as "management by objectives" and "sensitivity training". Sensitivity training, although as yet largely experimental, is held by many to be the key to the supervisor's dilemma: how to mediate successfully between the workers and management and make his role as the man in the middle more tolerable.

3. Evaluation of techniques and programmes

In the background of all these activities is the general endeavour, at all levels, to assess the effectiveness of methods and programmes. The CIRF evaluation study, already referred to, grew out of an earlier study undertaken and published by the Organisation for Economic Co-operation and Development (OECD) in 1963 [cf. Evaluation of supervisory and management training, Paris, OECD, 1963]. Both studies discussed the techniques and developments in this field from theoretical and methodological points of view.

A recent French evaluation study is particularly interesting from a methodological viewpoint. At the request of the National Planning Commission, the French Association for Increased Productivity has attempted (by using measurement techniques, and on the basis of statistics and social psychology and clinical analysis) to assess the results of supervisory training, and to determine the factors which governed them. Three research projects were carried out between 1962 and 1965: studies of (a) the individual changes in the attitudes of supervisors after undergoing training, (b) the occupational career of the supervisors trained, and (c) the relation between the characteristics of the firm and the effects of the training. Three other research channels were suggested for exploration: direct observation in workshops to determine whether and how the supervisor's behaviour changes after training; parallel studies of different methods of training in similar situations; more detailed study of the distinction inspired by cybernetics between a stable group with the fixed intention of maintaining existing relations, and a specific group whose resources can be mobilised at any moment to fit changes in plant targets (323).

Technicians

Like the supervisor, the technician regards himself as an intermediary, occupying a position somewhere between two categories in the occupational scale—the graduate or university-trained engineer and the worker—and belonging to neither. Irrespective of the opinions expressed; in fact, the technician is most often defined in relation to one or the other category. Time and again the abstracts support this view, whether the individual technician is working in agriculture in the USA (324) or in the industrial sector, as for example, mechanical engineering technicians in the United Kingdom (325).

Definitions and concepts

In the United States when defining the concept "technician", a distinction is usually made between engineering technicians and industrial technicians.

> "Engineering technicians, whose jobs have relatively wide scope and call for a high level of mathematical, scientific and applied technical ability, are usually field-oriented toward one of the major branches of engineering (mechanical, electrical, chemical, aeronautical, construction, electronics, etc.). They are required to have a broad post-secondary education received at a technical institute, junior college, etc. Emphasis is placed on applied technology which will prepare them to assist engineers, scientists or other professionals in the field. Industrial technicians, on the other hand, are "job-oriented" and operate within a narrower range of activities. Their work

> centres on specific jobs: inspection, quality control, trouble shooting, etc. Their training may be formal or informal, received in industry or at a vocational technical school. They need less mathematics, science and technology than engineering technicians, but more training and development in manipulative skills" (326).

This concept is not very far removed from the one adopted by the Conference of Engineering Societies of Western Europe and the United States (EUSEC) and reported in a series of abstracts on some of the papers presented to the Conference on the Educational and Training of Engineering Technicians sponsored by the British Institution of Mechanical Engineers in London in 1963 (325, 327-329).

The USSR concept of a technician seems to be slightly different. Practical experience appears to play a greater part in his training, such experience often being reinforced by correspondence courses, in-plant training or evening classes (330-337). Moreover, it is current practice for Russian technical school students to qualify for at least the level of 1st or 2nd category worker [there are normally 6 levels in the skilled worker category] in some trade or other during their production training. Skilled worker training is in fact considered a necessary preliminary to technician training (338). On the other hand, technicians in the USSR also seem to have functions which go beyond the standard concept of the technician's duties in many other countries, in that they are called upon to organise and control the work of others (339).

The requirement for technicians to have extensive practical experience is not exclusive to the USSR, however. It is referred to in the abstracts on the United Kingdom just mentioned, and in others. In the Federal Republic of Germany and in Switzerland, for instance, technicians are expected to have completed either a full apprenticeship or a specified period of guided practice in some type of approved manual work (340, 341).

Throughout the abstracts there are frequent references to the need for more practical experience for technicians while training. Very often practical training apart from the institution is considered the only way certain things can be taught, since the schools are rarely equipped with the latest types of equipment. Exposure to, and experience with numerical controls, automated processes, servo-mechanisms, etc. are often possible only in the equipment manufacturers' or production plant.

Perhaps the most striking trend shown up in the abstracts concerning technicians is the increasing complexity of the work they are today being called upon to do. A good example of this is given in an abstract of an article that discussed teaching numerical control troubleshooting. The syllabus included instruction in combinatorial logic, elementary Boolean algebra, truth tables, binary and binary-coded decimal systems, basic circuitry for specific control equipment, command generation, errorgrams, feedback devices, servos, tape readers, data input, troubleshooting, test and check circuits, maintenance techniques and instruments required (342). It is not surprising that the abstract reports that no one person nor any one school can teach the necessary material.

Technician staff in the developing countries

Whatever the concept applied in the developing countries, the dominant feature of the situation as regards technical and supervisory staff can be expressed in one word: shortage. The extent to which such staff are in short supply for replacing expatriate personnel and providing the drive necessary for economic growth, is difficult to assess for lack of adequate statistics. Numerous surveys of the need for and supply of technical manpower have been, and are being carried out in these countries, often with the help of foreign aid. A number of them have been selected for publication in the abstracts and have already been referred to in earlier chapters: a series of independent studies on high-level manpower in various countries, among them Malawi (148), Uganda (343), and Puerto Rico (149); surveys of factors in economic development, including technical manpower, carried out by the International Bank for Reconstruction and Development in, for example, Kuwait (138) and Papua and New Guinea (3); high-level manpower resources and requirements inventories executed by national authorities and planning bodies, as in Kenya (344) and Uganda (135).

Most of these countries are at the planning, or pre-planning stage as regards technician training. Where the national plans have advanced a step further they have mainly seen the technician and lower management staff as part of the wider problem of the expansion of general and technical education. Present as an undercurrent in most of the abstracts on these countries is to be found the general concern over the need to encourage enrolment in technical education. As stated in one abstract on the general problem of technical education for developing countries, students tend to enrol in the technical secondary stream only when places are not available in general secondary schools (345). And the alternative to school-based training—upgrading training in the undertaking—is seriously lacking. There are all too few examples of firms having an active technical and supervisory or management training policy, such as the Associated Cement Company's programme in India (346).

One of the answers, of course, is the pooling of training resources on a regional basis, and such a procedure begins to be feasible at the technician level. Below that level, problems of language, costs of magnitude, etc. would be likely to make it impractical and too expensive for the benefit received. As indicated in a colloquium on regional technician training programmes, convened in New Delhi (India) by the Colombo Plan in 1965, regional action in technician training holds much promise. Its possibilities have barely been touched (347).

Impact of the job on training programmes

Inevitably, different concepts of the technician function and variations in the job content are reflected in the training requirements and programmes—in the answers to the questions how, where, when and for how long should technicians be given training. In the chemical, metallurgical, mechanical and communications industries of Norway automated processes created a need for special training of technicians. In this case the answer was a three-year course for automatic control technicians and a one-year course for junior technicians in electronics or electricity (348). In France, where the educational system provides for two levels of technician training, it is held that it takes three years to train to the first level and five years to reach the higher technician certificate level. Moreover, on the assumption that articulation with or access to university education is both practical and worthwhile for technician trainees, a decision was taken in 1965 to establish higher technical training institutes which, though not attached to a university, would be of university level and would provide the desirable link between technician training and higher education (167, 349, 350). A similar formula for training technicians (and assimilated staff) in two-year courses in university-level institutions has been recommended by the Italian authorities on the basis of the findings of the Ermini Committee of Inquiry into the Educational System (191).

But the pace of technical change is such that planners of technical education cannot afford to limit their horizons to the immediate future of the next two or three or even five years. In France the "Groupe 1985" was set up in 1962 to think and plan for the desirable educational structure 20 years ahead (351). Reforms of electrical engineering programmes and syllabi, says an abstract from the United Kingdom, must be concerned with the probable developments of the 1980s and 1990s. This requires imagination and flexibility. Over-specialisation must be avoided. Preference must be given to teaching fundamentals and inculcating attitudes (352).

An abstract of an article discussing priorities in technical education in the United Kingdom expresses much the same ideas.

> "As regards the training of technicians the proposal of an 'umbrella' or 'two-tier' university, which would bring technical education within the ambit of a university, is particularly interesting. Placing the training of technicians within the same organisational pattern as the training of engineers and scientists would make it absolutely clear that technician training has its place alongside higher education. The transition from one level to the other would be easier. But the proposal would also bring with it the danger that technician training would be considered preliminary to higher education and not a training in its own right, designed for a specific level of tasks and responsibilities" (353).

It is generally accepted, then, that technicians need, and will continue to need, more and higher level training because of the increasing complexity of the work they are being expected to perform. Differences of opinion appear mainly in whether the final objective is achieved through longer initial training, via course intensification or through continuing training after entry into employment.

The selection problem

Probably in recognition of this increasing complexity of their functions, there is a decided and parallel trend towards more rigorous selection procedures and criteria. The 1964 rules of admission to specialised secondary schools in the USSR provide for two levels of recruitment according to their level of general education: persons who have not gone beyond the 8 years of compulsory schooling and those who have terminated the full secondary school course or have gone even higher (354). In the Federal Republic of Germany, in addition to having to meet the practical experience requirement already noted, persons wishing to gain admission to technical schools must at least hold a middle-school certificate (340).

The Conference on the Education and Training of Engineering Technicians, convened in London in 1963, when discussing the problem of the selection and recruitment of technicians, seemed more to stress general aptitudes than the acquisition of specific skills and knowledge. Selection procedures for technician apprentices, according to one of the conference papers, should be based on a minimum intelligence level requirement, assessed on school records (including mathematics or physics and English language) and on intelligence tests. The latter should be of a matrix character involving no previous knowledge. General aptitude should also be tested to detect characteristics such as physical imagination (the ability to imagine, from evidence visible externally, what is going on in the invisible part of a mechanism), space perception (to assess success potential in draughting and patternmaking), and personal traits likely to be success factors (327).

Certain industries and occupations require special qualities, skills and knowledge. An article published in the USA in 1962, for instance, appeals for better devices—rating forms or aptitude tests—for testing personal characteristics, such as imagination, patience and tenacity, essential for success in computer programming (355). In general, however, it is felt that the selection criteria should concentrate on basic skills and aptitudes:

> "an adequate knowledge of mathematics and basic science;
> "an acquaintance with appropriate workshop and laboratory skills;
> "a competent knowledge of specific techniques; and
> "an ability to communicate both ideas and information to other workers..." (356).

These four essential requirements are substantially those recommended some years earlier by the US Department of Health, Education and Welfare (357). A two-year post-secondary school curriculum has gained recognition as the desirable educational level for technicians in the USA. The recruitment basis is roughly the same in France. The reform of the French educational system, however, has introduced changes in the actual recruitment basis for technician training, and particularly that of higher technicians. Admission will no longer be limited to those who have had a full secondary technical school education but will be broadened to include candidates coming from other secondary education streams. New regulations permit a greater degree of equivalence between streams, and the training at post-secondary level will be provided in the newly established (1966) University Institutes of Technology which will train higher technicians and other senior technical production and administrative staff for public and quasi-public bodies and private undertakings (167, 358).

Status

The question of the status of technicians has been left till the end of this chapter because it is so closely linked with each of the aspects discussed above. Concepts of status will vary with the concepts of role and function, with the recruitment basis and the level and duration of training provided, and with the type of institution providing the training. The almost chaotic situation as regards the scope and content of his title is one of the chief obstacles in the path of recognition of the functions and qualifications of the technician. If the firm is small, the technician tends to carry the responsibilities of a technologist and to be part of management; in the large firm, his duties are usually more narrowly specialised. The OECD study on the training of technicians in Ireland (359) gives a typical example of this situation. In summary: "The functions of the 474 technicians surveyed could be roughly classified into 8 categories: design and draughting—64; installation and erection of plant and equipment—18; operation, maintenance and repair of plant and equipment—50; inspection, analysis and testing—93; purchasing and sales—2; operation and control of manufacturing processes—170; estimating, rate fixing, work study—38; laboratory supervision—7; 'other'—32.

"The research team held some reservations regarding the level of the functions of 185 of the 474 technicians studied. Most of the doubtful cases were engaged in inspection, analysis and testing (32 out of 93, or 34%), the operation and control of manufacturing processes (55%) and the group of 'others' (78%)."

Doubt concerning the validity of the title was due to a number of factors: absence of a nationally accepted technician diploma, predominance of consumer and intermediate goods industries rather than capital goods industries, managements unconversant with technical and scientific issues. Lack of a standard approach among industries is another deterrent: the newer industries tend to recognise the technicians, the others to lag behind.

Certification

One of the chief methods by which recognition of technician status is sought, is through institution of a system of certification. Many of the abstracts show a general trend towards trying to give the technician more formal recognition of his training and experience. Certification and formal recognition of titles, it is felt, could help bring about a measure of standardisation and thus a basis for defining status.

This problem has come in for considerable discussion. A clash over the interpretation of the titles "technician" and "higher technician" (ingénieur-technicien) in Switzerland, and the right of certain technical schools and colleges to issue the corresponding certificates, led to a national referendum which held up application of the 1963 federal vocational training law for a full 18 months after the Act had been passed by parliament (341). In the Federal Republic of Germany there is agitation for national certification for the technician and higher technician levels, backed by legal recognition of status (361). Basic regulations for the training of technicians were issued by the Permanent Conference of Ministers of Education in April 1964, but the drafting of similar regulations for the qualifying examination was postponed, a situation which was deplored by the German Federation of Trade Unions in an article published a year and a half later (362, 363).

New regulations and syllabi in France established a comprehensive range of courses leading to formal technician certificates in different branches of activity, in either the industrial or business streams (349). Following an inquiry carried out in 1962, the Institute for Industrial Reconstruction (IRI) in Italy recommended a certification system with five levels. To the present three-level structure would be added a "lower technician" (tecnico intermedio inferiore), coming between the vocational school graduate and the graduate of a 5-year technical secondary school, and a higher technician (tecnico superiore, or tecnico intermedio superiore) between the latter and the graduate engineer (364). The system would provide possibilities for transition from one level to the next.

Promotion from the ranks

Recruitment through upgrading and training for promotion has always been characteristic of the technician category of employee. Laudable in itself as a means of social advancement and likely to be continued, if the recommendations of the New Zealand Commission of Inquiry are anything to go by (130), this system has sometimes had detrimental effects on the technician concept and status, as stated in the IRI study and in another Italian article on the subject (365). The general move to raise the status of the technician through a multitude of supplementary training programmes during the course of his working career, and the more flexible approach to formal technical education with its resultant easier transition from one level to another, bring with them, as already indicated above, the danger that technician training will be considered merely preliminary to higher education and not a training in its own right (353).

The technician has his own functions and place in the occupational structure. He must be neither a superior skilled worker nor a second-class engineer. Implicitly, this is universally recognised—in all the current studies to determine the desirable ratio of technician staff to graduate engineers, for instance. In Poland, in Czechoslovakia and Eastern Germany (366), as in the USSR (339) and in the countries of Western Europe, Asia, Africa and the Western hemisphere generally, research is being carried out to develop methods of assessing the economy's real needs in technical staff, and those of individual firms and specific sectors. Only in Poland has the output of the vocational schools and technical colleges appeared to be out of step: there are too many technicians in relation to the output of skilled workers (367); elsewhere the technician tends to be in short supply. Consequently, as in the case of skilled worker training, the measures taken and proposed tend to follow parallel, short-term and long-term lines.

This chapter has concentrated on the long-term aspects of technician training. Short-term measures can only be looked on as temporary and likely in the end to undermine the position of this large and important sector of the occupational hierarchy.

V. Teaching and instructing staff

Vocational teachers and instructors

If one were to attempt a composite portrait of a vocational teacher or instructor it would probably depict someone in need of further training to upgrade or update his skills, someone who has considerable uncertainty about his role and status and someone who is in extremely short supply. He is also the kingpin in the whole vocational training and technical education structure. It is a temptation to let this simplified picture represent the essential trends that emerge for vocational teachers and instructors in the abstracts.

Perhaps the most striking element in the over-all picture is the considerable amount of discussion there has been regarding the role and status of the vocational teacher, both within the educational and training systems and in society as a whole. Role and status are, in fact, among the most frequently recurring themes. One of the earliest abstracts in volume 1 contains what is virtually a plea to the countries of Western Europe to improve the qualifications of all teaching staff, and particularly of instructors, and to avoid short-term measures likely in the long-run to be detrimental to the profession (368). In the 6th volume the discussion reaches a peak with the Recommendation concerning the status of teachers adopted by UNESCO's Special Intergovernmental Conference on the Status of Teachers, held in September-October 1966 (369).

Role and status concepts

Two basic distinctions have arisen in the role concepts of the vocational teacher—the result of organisational differences in the national systems of vocational training. In countries which have traditionally emphasised the educational values of vocational training it has been customary to assimilate the vocational teacher to his counterpart in general secondary education. In systems stressing the trade and employment aspects of training, on the other hand, the vocational teacher must necessarily have a much stronger link with the employing sector of the subject he is to teach and a more practical bias to his training: he is likely to have been a skilled worker first and to have become a teacher subsequently.

Differences are also often made, within the vocational education sector, between teachers of theory and teachers of trade subjects or workshop practice, as in the case of the memorandum on vocational teacher training prepared by the Swiss Vocational Schools Association (370). In addition to confirming this division of the teaching corps into two groups, the Association emphatically opposed any move towards introducing the "all-round" vocational teacher concept found in many countries. A parallel might be drawn between this attitude and the long-standing discussion about the effectiveness of the class teacher (as compared to the subject teacher) in vocational schools in the Federal Republic of Germany, or (in a narrower field) the incompatibility felt to exist in the USSR (371, 372) between specialised teaching—held to be distinctly preferable to class teaching—and the existence of large numbers of small rural schools scattered over wide areas.

Two factors, however, are likely so to influence and clarify the whole role and status discussion that the problem will diminish in importance, or perhaps disappear altogether: the apparent trend towards specialised teacher training colleges and the equally general trend towards organising a systematic upgrading of the skills and knowledge of vocational teachers and instructors. To these factors might perhaps be added a new concept of the teacher's role which, if accepted and applied, may have far-reaching effects. It suggests that basically a teacher can only engage in two types of activity: he can manage learning resources or he can operate as a resource himself. Admitting that the time available to teachers, and their individual aptitudes and abilities, must always be limited, then obviously they should concentrate, in so far as possible, on the organisational role and become managers of resources for learning. Developing such a system would imply rethinking and redesigning the whole learning process, and with it the role, qualifications and training of the teacher. It is not difficult to see where this type of reorganisation might lead. Not only would the form and content of teaching and the teacher's function in the learning process be changed, but it would encourage the use of teacher auxiliaries for the more routine duties, intensify the use of teaching aids such as correspondence courses, TV, teaching machines, programmed texts and tape-recorded instruction, allow the use of more informal teaching methods, permit students to progress at their own individual rates of learning, and even change the architectural basis of the school from a teaching to a learning design (373).

Whatever the precise definition given to his work and role, the general function attributed to the vocational teacher is the same: he is expected to prepare his trainees for active participation in the economic life of the community and in the society in which he lives and works. Key points in the role and status discussion therefore tend to be the recruitment basis to the profession, the amounts of practical training and work experience required, the level of academic preparation considered desirable, and where and when the training should be given.

Recruitment basis

Most countries make distinctions between the levels of training and experience required of teachers going into different types of vocational education and training —secondary or post-secondary, for instance, or adult education—and into teaching different types of subjects. Regulations issued in Luxembourg in 1961 require a master-craftsman certificate of candidates for a vocational instructor post but a secondary school certificate and at least six terms at university for a vocational teacher (374). A similar system was instituted by ordinance in Poland in 1962 (375). In Canada three levels of technical/vocational teacher training are commonly practised—for secondary technical, institute of technology, and adult vocational education programmes respectively—and the recruitment basis is different for each (376). Similar distinctions exist in Italy and are likely to be retained in the country's new educational structure (377, 378), and have been introduced in the training organised by the recently established Higher Training Institute for Technical Teachers in Argentina (379). The status, duties and title of vocational school instructors (Lehrwerkmeister) are not clearly defined in the Federal Republic of Germany. A study among instructors in vocational schools in Hessen in 1964 revealed they had five main functions, applied in different combinations, as well as many subsidiary responsibilities; but all had had master-craftsman training as their basic qualification whereas, for the vocational teacher, full secondary school education is the normal recruitment basis (380).

University training

One outcome of the scrutiny being given to vocational teacher training systems all over the world, and the endeavours being made to raise the status of the vocational teacher, is the growing support for giving at least part, if not all of the vocational teacher's training in universities or assimilated institutions. In the Federal Republic of Germany this is nothing new. It has always been felt essential for vocational teacher training to be carried on in the atmosphere of a university: the vocational teacher needs to be able to benefit from the constant evolution of ideas within the whole range of university activities (381). It is considered that three years of university-level training is an absolute minimum, with four years being desirable in certain cases (382). At a conference in Hamburg in 1961, representatives of vocational teacher training colleges went further, they recommended prolongation of all vocational teacher training programmes and expansion of their scope to include studies of both the economic and the technical concepts of the subject of specialisation, as well as the basic mathematics and sciences, technology, design and production techniques applicable in this field, and an introduction to subjects such as industrial hygiene, work organisation, general and business economics, psychology and sociology (383).

Parallel in substance to the recommendations formulated by the Swiss Vocational Schools Association already referred to (370), the proposals of the Hamburg conference were taken up subsequently by the German Association for Industrial Training in requesting the state Ministers of Education to adopt basic regulations governing the organisation of vocational teacher training for the whole of the country (384). In line with these recommendations, the University of Hamburg decided, four years later (1965), to reorganise its vocational teacher training system and to prolong the academic part of the training by the simple expedient of postponing the compulsory teaching practice to the probation period performed after completion of the academic programme (385).

The principle of university training is to be found in the Luxembourg regulations already referred to above, and in the various proposals to the effect that colleges for training vocational teachers not only should be of university level but should also be autonomous institutions (370, 378, 379, 383). It was also recommended, in July 1960, by the Council of Ministers of Eastern Germany, where the Institute for Training Vocational School Teachers (Leipzig) has established special correspondence courses to bring the educational qualifications of suitable candidates up to the required university level (386, 387), a measure strongly reminiscent of the "Zweiter Bildungsweg" measures instituted in the Federal Republic of Germany in the 1950s.

Even in countries where university training has not previously been customary for vocational teachers, there is increasing support for closer links between higher education and vocational teacher training. In the USA, for instance, a study was carried out in 1966 in the State of Iowa to ascertain how many vocational teacher training institutions grant college or university credits for trade experience, and suggested formal procedures for the equitable allocation of such credits (388). At much the same time a committee set up in Kentucky to draft a new plan for ensuring an adequate supply of professionally trained and competent trade and industrial teachers, recommended the institution of associate bachelor degree programmes at universities, with the objectives of preparing persons with limited trade competence for entering the teaching corps, of upgrading the academic and technical qualifications of vocational teachers already in employment and of training persons entirely new to the teaching profession (389).

Further training and education

Another recurring theme throughout the first six volumes of the abstracts is the need for vocational and technical education systems to provide adequate facilities for the further training of their teaching staff throughout the course of their career. Like the skilled worker, the supervisor and the technician, the vocational teacher needs opportunities for retraining and updating, as much to learn the new developments in his own speciality as to become more proficient in teaching techniques. He needs to be taught how to use the new teaching aids being placed at his disposal (390). He needs to be helped to introduce more realism into his instruction as, for instance, in the pilot programme in the USA (391) intended to keep vocational and technical teachers in touch with developments in industry.

Much that has been said on further training and education in previous chapters, has a bearing on the further training of teachers and instructors. On the whole, however, comparatively few abstracts have specially singled out this aspect of the vocational teacher/instructor problem. A general discussion on it in the Federal Republic of Germany is to be found in one abstract (392), and an interesting scheme for updating vocational teachers in forestry in Sweden—an industry which has seen immense technical changes over the past few years—by giving them one week's further training every year, has also been noted (393). Some of the implications of the problem are to be found in abstracts from the USA on methods used for training teachers of automation principles and techniques, another very fast changing field of instruction, and on ways of fighting "teacher obsolescence" in business education (394, 395). In Poland, part-time courses for upgrading teachers already in employment were started a few years ago with some success at a teaching methods centre (396), while further training for teachers at plant schools is organised largely through correspondence courses (397).

Organisational problems

The questions where vocational teachers should be trained, what they should be taught and how their training should be organised, have given rise to considerable discussion reflected in the abstracts throughout the period under review. The answers proposed have been influenced, jointly and independently, by a number of factors: the new or better-defined functions devolving upon them, sometimes as a result of the basic reforms of the educational system being introduced in many countries; the milieu from which the teachers have been recruited; the pressures exerted by the current and universal shortages of teaching staff of all categories and levels, and the equally universal demand for more and for better training facilities of all types; the general reforms of the educational structure undertaken by a number of countries during the 1960s. Organisationally, these elements have resulted in the development of parallel long-term and short-term measures which are often contradictory.

Educational reform automatically implies reform or reorganisation of teacher training. Successively the abstracts have shown the implications of the changes in the educational structure in Poland (398), France (399), Italy (378), Sweden (400), the Federal Republic of Germany (401) and in a number of other countries. The impact of educational reform has, of course, been equally strong in the developing countries which in many respects constitute the largest and most active experimental area in the field of education and training.

Supply and demand

The most carefully laid plans for improving the quality of the teaching staff, and the most comprehensive organisational structures for vocational teacher training, are likely to be nullified or at least seriously hampered by the present worldwide shortage of technical and vocational teaching staff. As an outgrowth of increased demand for trained craftsmen and technicians and of the more systematic projections for determining future requirements, there is a general awareness of the need for more and for better qualified vocational teachers and instructors and of the inability of existing teacher training facilities to cope with the demand. Moreover, for some time to come, the shortage not only is unlikely to diminish but will even build in magnitude.

The abstracts are full of references to this universal and crippling shortage situation, which is as critical in the developing countries as in the countries which have already attained high levels of industrial development and mass education. Successive reports on the evolution of the social situation of the European Economic Community have referred to the shortage situation (34, 402). A report of the Secretary-General of the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas (Geneva, 1962) unequivocally gave instructor training first priority because of its "multiplier" effect, although noting that economic development will be best served by raising the skill levels of persons already in employment (403). This same multiplier effect underlies much of the emphasis on teacher training in many bilateral and multi-lateral technical co-operation programmes, such as the activities of the US Peace Corps (404) and of the ILO's International Centre for Advanced Technical and Vocational Training, established at Turin with the co-operation of the Italian government in 1963 (405). In the latter case a basic principle for selecting candidates for fellowships at the Centre is that they shall be of sufficiently high calibre to be able, on their return home, to "serve as teachers and instructors or else hold positions of responsibility enabling them to pass on their newly acquired skills and knowledge to others".

Unfortunately, as pointed out in an abstract of a recent OECD study on the conditions necessary for successful technical assistance to developing countries, present efforts fill a gap but are not enough: "There are about 38,000 teachers provided through bilateral technical assistance schemes of OECD countries: 20,000 in primary schools but only 3,000 in technical and vocational training, where the needs are most pressing" (406). The same situation is described in an abstract on technical assistance arrangements between France and the French-speaking countries of Africa: "The total number of teachers supplied by France to the African countries nearly doubled between 1960 and 1966, while the total number of technical assistance personnel remained fairly stable... true progress will only be accomplished in technical and vocational training when the Africans themselves are able to provide the nucleus teaching force—leaving technical assistance to strictly defined areas or to advisory functions" (407). The problem becomes a vicious circle: countries already short of teaching staff become even shorter through helping others to make up their own teacher deficits.

Some solutions to the shortage problem

In the light of the above there is obviously going to be a common move to expand all existing teacher training facilities, to create new ones and, at the same time, to introduce short-term measures to meet immediate acute shortages in particular fields or at specific levels. Examples taken from the abstracts tell of the establishment of new teacher training centres in Yugoslavia to meet shortages of vocational teachers for vital fields such as the construction industry, mining and commerce (408); provisions in Uganda's second 5-year Plan to expand teacher training facilities (135) since "secondary education is extraordinarily dependent on expatriate teachers"; acute shortages of teachers for business and clerical training in Australia (409) and the Federal Republic of Germany (410).

In the latter country, alarmed by the prospect of some 9,000 unfilled teachers' posts in the vocational schools and colleges of Nordrhein Westfalen (Northrhine Westphalia), the German Federation of Trade Unions has proposed a scheme for assisting technicians to become vocational teachers through a process of planned teaching practice, part-time university-level study, a probation period (one year) and a public examination based on the state examinations in the regular teacher-training programme. The training would take, in all, some 4 to 5 years to complete (411). In Eastern Germany a government Order issued towards the end of 1966—again somewhat reminiscent of the "Zweiter Bildungsweg"—provides for skilled craftsmen in mechanical and electrical engineering, the building trades, agriculture, the chemical industries and the wholesale consumer goods distribution sector, to be given an opportunity to become qualified as vocational teachers in charge of practical courses by completing a programme of three years of full-time study (412).

In Sweden the government's policy for providing extensive retraining facilities for adults has resulted in increasing the number of such courses from 60 in the mid-1950s to some 1,000 in 1967, and in an inevitable shortage of teaching staff to man them. Emergency measures were introduced in 1966: a scheme whereby vocational teachers already in employment are released "in stages" for a few weeks at a time for theoretical training, and then return to their jobs and continue their training through practice and private study (413). Other measures recommended in Sweden by a special working party appointed by the government to consider the teacher situation in secondary technical schools (training higher technicians) include: a greater use of correspondence and other part-time courses for technical education, standard examination requirements, greater flexibility in recruitment of full-time and part-time teachers, better incentives for entering the teaching profession, and improved career prospects (414). In many countries, immediate needs are being met by the use of part-time instructors who, although not fully qualified, are given "emergency" pedagogical training in crash programmes. There is some tendency to deplore this practice (the Australian article on commercial teacher training is entitled "Teacher training moves backward" !), but pressures are currently great enough to override such objections.

Training officers and instructors in industry

Most of this chapter has been concerned with teachers and instructors in formal, school-based vocational training systems. In situations where vocational training is given mainly within the undertaking, however, much the same problems are being encountered and many of the same questions asked. The training officer—or training director, as he is called in some countries—is striving to get clarification of his role and functions and a recognised place and status in the hierarchy of the undertaking; he is in short supply just when there is accelerated need for his services.

The role problem

The abstracts on the United Kingdom present the best coverage of the training officer situation over the past 5 to 6 years. A pilot study carried out by the British Association for Commercial and Industrial Education (BACIE) in 1961 attempted to discover, on the basis of a random sample of some 80 "training conscious" firms in a given area (mainly industrial firms but including 10 which were chiefly commercial or in the retail business), the functions and qualifications covered by the title "training officer". The study was inconclusive. The title was felt to be no guide to the degree of responsibility exercised: in about 56 per cent of the cases studied, training was part of the personnel function; in the remainder the training officer reported direct to higher management (415). Eighteen months later one of the main criticisms of the Government's White Paper on industrial training was its omission of any reference to the need to build up an efficient corps of training personnel in industry (416). The following year the Industrial Training Council, in a short study on the roles and functions of different categories of such staff, distinguished four levels—the training instructor, the group training officer, the training development officer and the training officer proper—and discussed their respective qualifications and training requirements. Simplified, this structure was resolved into two levels: the training specialist, likely to be more of a co-ordinator and administrator than a teacher, and the training officer—the operational man (417, 418).

Drafting of a policy with respect to the functions and training of training officers was subsequently one of the early tasks undertaken by the Central Training Council, which in 1966 published a first report of its specialised Committee on the Training of Training Officers, and proposed an introductory course to give training officers an insight into the training function and their individual role as they were likely to develop with application of the Industrial Training Act which, at that time, had been in operation for a little under two years (419). It is interesting to note here that, long before publication of the United Kingdom White Paper on industrial training and the subsequent discussion on the training of training officers, the annual report of the Treasury (1960-61) had already contained a comprehensive discussion on the

Treasury's experience and policy in this field. Concentration of responsibility, broader training programmes, inter-departmental co-operation and emphasis on management skills were key points in the report (420).

Parallel with this development in the United Kingdom, the abstracts have noted similar inquiries into the role of the training officer in Sweden (421), Australia, where the Melbourne Division of the Australian Institute of Management set up a committee some years ago to investigate the situation (422) and, more recently, in the USA where in 1966 the American Society of Training Directors undertook a nation-wide study of the functions assigned to training directors (or training officers) by its member organisations (423). A somewhat similar study—but on a narrower basis, being limited to the role, qualifications, status and functions of the training officer in government services—has been made in the Philippines (424).

A practical approach to the instructor training problem has been noted in the USSR where there is a tendency in the mechanical engineering industry to recruit highly qualified foremen, charge-hands and skilled workers and to give them pedagogical training in order to fit them for posts as instructors for training new employees (425). This procedure may, however, be a solution in name only, as there is a parallel tendency to give engineers who have had pedagogical training jobs as teaching methods specialists in the plants' training departments, thereby effectively removing them from the active training function for which they have been prepared (426).

The goal ahead

The plea for a permanent corps of specialised training officers reported in one of the United Kingdom abstracts (416) emphasised the need to recruit the "right type of person for the training officer function". It describes the training officer's job as simply one way of ensuring optimum utilisation of available manpower and goes on to say that "A large firm should therefore have a department which would take over all manpower functions... and would service the production department with labour. The work of the two departments would have to be very closely integrated." In such a system, the training officer would be a member of a team in the former department and, as such, would need to understand the duties of his other "manpower functions" colleagues. Consequently, specialised training restricted to his own functions would be too limited. It would be better to envisage establishing a "manpower functions training institution" which would include training for the training officer but would provide it within the framework of a much wider programme. This broader approach to the training officer problem is suggested as a long-term solution by no means incompatible with the short-term objective of specialised training. It is an approach which would necessarily work towards a general raising of the training officer's status both at his place of work and in society as a whole.

There would also seem to be a need for firms to take a new look at the training arrangement made for their training instructors. Like the foreman and supervisor, the instructor in industry needs to be helped to master the techniques of his instructing function. Whether he exercises the latter on a full-time or a part-time basis, he will need basic knowledge of the elements of psychology and pedagogics and a good grounding in teaching methods and communication skills. In many cases this training can be given in conjunction with the training in instruction techniques given to supervisors, to the mutual benefit of each.

VI. Training methods and teaching aids

A scanning of the abstracts concerned with training methods and facilities, equipment and teaching aids—chiefly CIRF classifications 13 and 14—could lead to the conclusion that training methods are purely subject to fads and fancies. Programmed instruction and teaching machines, mentioned just three times in volume 1—and each time with reference to the USA—have figured extensively in subsequent volumes in abstracts covering a wide range of countries. The use of computers in instruction, merely sketched as a possibility and a field for research in 1965 (volume 4), has been followed by abstracts of articles describing actual trials and experiments. CAI—Computer Assisted Instruction—is coming into the language just as PI (Programmed Instruction) has gained recognition in training circles and as TWI entered the trainer's jargon before that.

There is a recognisable progression from the idea to the experiment, to the practical implementation, to attempts to assess the effectiveness of the methods and then to improve them. Those which prove of doubtful or limited value are encountered less and less frequently in technical publications—and consequently also in the abstracts. The fads drop out of sight altogether.

This chapter, therefore, is largely one of experimentation and research, guided—or driven—by needs which have already been discussed in other chapters. Some of these needs exert contrary pressures. The volume and complexity of material to be taught have increased: ways must be found to teach more in less time. The universal and chronic shortage of teachers of all levels and all types is aggravated by the growing clamour for more and for better training: the instruction must reach more people, be conveyed over greater distances and wider areas. The growing acceptance of the idea that training is a lifetime process means that instruction methods must be directed not only towards young people who need to be helped to adjust to the adult world of work, but also to adults with many years of active work experience behind them. With this latter requirement comes increased recognition that character development plays an important role in training, that people need something in addition to mere technical expertise, that vocational training must be concerned with the education of the whole personality of the individual and must help him to adapt to changing techniques and new situations.

Finally, there is the natural creative desire to experiment with new technologies, to see whether and how they can be brought to the support of the hard-pressed vocational teacher and instructor.

Rationalisation of training

One of the main ways in which trainers and educationists, government services and employers alike attempt to gain time and yet cover the subject matter to be taught, is to apply a process of rationalisation. This has meant taking a new and critical look at established training objectives, criteria and syllabi, and at the methods being used to convey the instruction. It has also meant, in many cases, an increased use of a job analysis process, a systematic breaking down of the individual jobs into their component parts to determine precisely what skills and knowledge are required for efficient job performance, and how best to convey them to the individual trainee. In many sectors it is felt that such an analysis is the only basis on which an appropriate training syllabus can be drawn up (427). Two articles, one published in the USA and the other in Belgium, carry this idea further, attributing responsibilities and competencies to the methods office of the undertaking (428, 429) and suggesting that the analysis should not be limited to the technical content of the job: there should also be a detailed analysis of the actual movements entailed in its performance.

This approach is in effect an application to all training programmes and syllabi of the well-established rationalisation principles underlying accelerated training or, as it is also known, analytical training. Numerous examples of such an approach are to be found in the abstracts: an Australian experiment to test the respective effectiveness of the "progressive part" and "whole" methods of analytical training for teaching women packers on short cycle, repetitive work (430); examples of analytical training in an Australian textile mill (431) and in a radio valve assembly plant in the United Kingdom (432); the elemental method (EMT) described in an American article (433); the discussion of the development of the whole system of adult training in France under the National Association for the Vocational Training of Adults (AFPA) and its predecessor, the ANIFRMO (National Association for the Rational Vocational Training of Manpower) (434, 435), and the parallel movement in Belgium (436); the spread of the system into the institutional structures of other countries, for instance, Chile (234) and Tunisia (233). As may be seen in several of these references, and in another one drawn from the United Kingdom (432), the system is no longer considered limited to the rapid training of adults, but is applied also to the training of new entrants to the employment market where it has invariably achieved reductions in learning time and increases in productivity.

It is perhaps interesting to note in this connection a view expressed in an abstract of an article on training continuous process operators in oil refining and cracking in the USSR, which indicates a practical limitation on the use of analytical methods and states that "this type of work is not apt for analytical study and breakdown; training for it cannot be based on instruction merely in a series of consecutive tasks". It recommends exercises on special training apparatus capable of reproducing various types of complex chemical reactions obliging the trainee to respond to successive situations, and progressive drill in observation and interpretation of data received (437).

Testing for effectiveness

This more scientific approach to training has been leading many authorities, trade associations, employers and vocational education and training specialists to re-examine the objectives established for training programmes. Demands for evaluation of training effectiveness, for the establishment of specific objectives and for training within rigid time limits are on the increase. There is also greater interest in and use of testing to measure training results, not just at the end of training but at specified intervals throughout the training period in order to assess progress and draw conclusions for modifications and improvements in the method or programme. Two abstracts in particular could be referred to by way of example. In the Federal Republic of Germany the practice of intermediate tests for apprentices has been gaining ground. Introduced by some 70 Chambers of Industry and Commerce (out of a possible 81), such tests are recommended as a means of influencing the effectiveness of the training provided (438). In the United Kingdom where, unlike the Federal Republic, final trade examinations are only rarely compulsory for apprentices, the coalmining industry has recommended a system of practical tests at specified stages throughout the training. They would "aim at establishing standards of skill... and permit instructors to appraise the effectiveness of their teaching, showing up any training defects and permitting immediate remedy, if necessary by modifying the syllabi" (439).

Very often the objectives set take the form of specific goals in terms of both productivity and quality. A few attempts have been noted to lay down formal work norms for technical school trainees in the USSR, based on the standards set for adult workers in the plant providing the production training (440, 441). Usually, however, as in both these examples and in an abstracted article on the Ukrainian SSR (442), the establishment and application of such training norms is still being done on a purely experimental basis.

Programmed instruction

The tremendous rise in popularity in programmed instruction (PI), or programmed learning as it is also called, can be considered another direct outcome of the rationalisation of training trend. Six years ago the references to programmed instruction picked up for abstracting tended to be novelty oriented; there was also a considerable amount of confusion between the method itself and one of its media, the teaching machine. There was opposition from teaching staff, fearing a diminution of their role in education (443); there was only guarded enthusiasm from some countries, in particular from the Federal Republic of Germany, where it was felt that educators were not attuned to the "empirical attitudes" required by PI (444, 445). From both the USSR (446) and Norway (447) came warnings against expecting too much of teaching machines—a counterbalance to enthusiastic responses from elsewhere.

Purely descriptive abstracts on types of teaching machine and on how to use them in the USA (448), on a teaching machine constructed by a technical college in the USSR (449) and on the first PI programme in Berlin (450), have given way to details of more systematic experiments, analyses of basic principles and assessments of effectiveness. Early doubts seemed to disappear, to be replaced by acceptance and approval—and by more realistic appraisal of possible fields of application. Doubts about programmed instruction's ability to transmit general concepts have subsided: the results of evaluation projects seem to indicate that programmed learning does not stifle individual thought and that knowledge acquired through PI is a permanent acquisition.

Much of the early experimenting has been done in a school setting—both general and technical education schools—but industry and commerce soon grasped the potential of PI for upgrading their staff and training them in specialised skills. The abstracts have picked up, for instance, PI programmes developed in the USA for department store employees and sales staff (452, 452), for insurance company claim approvers (453) and for teaching technical drawing (454). In the USSR programmes have been tried out for training technicians (455) and lathe operators (456), for teaching electrotechnics in a technical college (457) and in 9th and 10th-year production training classes in mechanical engineering (458). A textile firm in Australia developed a course of PI for training colour matchers in the elements of colour theory (459); the Italian National Office for Occupational Safety (ENPI) has applied programming to safety training in the erection of scaffolding in the building trades (460). Ingenuity of application is readily apparent as programmes are adapted to the training needs of people normally difficult to reach, such as shift workers (461) and what one abstract terms "residual" groups of society—the physically or culturally handicapped, the migrant, the displaced worker—not being adequately reached by existing educational institutions (462).

In many countries programmed instruction has now reached a third stage on its rather spectacular path to acceptance as an approved training method. Responsible bodies have instituted research projects on its present and possible future uses. They have evolved a whole new section of training terminology (463). They have attempted to determine the effectiveness of PI as compared to other, more conventional methods of instruction (464, 465), to assess and compare the efficiency and uses of branching and linear programmes and of different types of teaching machine (443), to test the relative effectiveness of teaching machines and other forms of programmed text (466, 467), to measure the impact of full, partial and integrated PI in teaching a given subject or category of person (468). Most of the assessments stress the importance of applying scientific principles in the preparation of programmes, of testing and retesting them before releasing them for general distribution. There is also, as expressed in an abstracted article from the United Kingdom (469), a feeling that programmed instruction has "not yet achieved full effectiveness... because the programmes themselves have been based on the printed word. If PI is to become really effective in the classroom and generally applicable in reaching the majority of adults in industry, it should make use of not merely the written word but also the pictorial image and sound". This was also one of the views expressed in the study sessions on PI organised in Nigeria and Jordan in 1963 and in the recommendations of the UNESCO Working Party on programmed instruction in developing countries (470).

From PI to CAI

From a long-range point of view the most interesting development is the combined use of programmes, teaching machines and computers. Considering its vast potential, CAI—computer assisted instruction—might perhaps best be described at this stage as an incipient trend. Computers which can bring to the student complex simulations, limitless information storage possibilities and an analysis of the student's learning behaviour, enlarge instruction possibilities immeasurably. The scope and effectiveness of teaching machines can be expanded by computers, especially in the "Socratic system", described in one abstract, which permits a controlled verbal or non-verbal input to be assimilated and rendered in an unconstrained computer display using natural language (471). It should be possible, in time, to build up a two-way dialogue between teacher/computer and pupil, with the computer responding to natural language input as well as to the coded "Socratic" language.

Considerable research is being done in the USA in the field of computer assisted instruction, but the work is still only in its initial stages. As with programmed instruction, much of it is being done in a school or college setting: student learning behaviour, the impact of computer-oriented instruction on school curricula (some secondary schools are already including introductory courses in cybernetics and probability theory), problem-oriented computer languages (472). The applicability of CAI to industrial training is also being explored, however, as shown in an abstract on IBM research in this field (473). It is held in this text, based on a pilot study, that "(1) it is possible to integrate education into work; (2) it is feasible to have education chase industrial personnel rather than to have these personnel chase education". In the study, service "engineers" were being trained on the job and could be called away from the training equipment for doing emergency repairs. The memory and recall abilities of the computer made such interruptions less troublesome than might have been expected. Additional advantages in a rapidly changing industrial environment are the computer's ability to rapidly update its training programme and to link individual students and study groups dispersed over wide areas, giving them the benefit of standardised instruction, individualised guidance and a wealth of stored-up knowledge on which to draw.

Tele-instruction

Less dramatic than the methods and media just discussed, training by correspondence is another of the methods resorted to in attempts to combat the shortage of teachers and instructors and to meet the constantly growing demand for higher qualifications, updating and further education. Correspondence courses as such are no innovation. They have always been a prominent means of instruction in countries with remote or large, sparsely populated areas making the adequate provision and the location of school facilities problems of doubtful economic return. They are available in a wide range of technical and general education subjects, as well as in any number of trade specialities.

What is new, however, is the more systematic approach being given to their organisation and status in the education system. In the past, and with the exception of certain countries, correspondence courses have been largely left to private initiative. Some of the advantages and disadvantages of the system were discussed in a 500-page comparative survey of correspondence study as practised in the Federal Republic of Germany and in 12 other countries (474), and in surveys of its position and status in Sweden (475) and in France (476). In the latter country, some 500,000 persons—or one per cent of the population—are studying by correspondence each year. As the correspondence course schools are not officially recognised, however, correspondence institutions rarely issue their own certificates but usually prepare their pupils for the regular public examinations.

There is a conscious and general attempt to assess the effectiveness of the method and to raise its status in the educational system. The comparative survey just referred to deplores the reluctance of the government of the Federal Republic of Germany to give correspondence institutions official recognition (474); another abstract from the Federal Republic recognises the growing importance of "tele-education" (i.e. instruction from a central agency, given by correspondence, radio, etc.) in promoting adult education and urges the education authorities to exercise some sort of supervision over it (477). In France, an important step in this direction was taken in 1959 with the incorporation of the French National Tele-Instruction Centre into the Education by Radio, Correspondence and Television Services of the National Pedagogical Institute, and the creation (1963) of the National Council for Technical Education by Correspondence (476).

In several instances, as in abstracts on France (478), the USSR (479, 480) and Eastern Germany (481), education by correspondence is criticised for being too impersonal, for being prone to high dropout rates and also, in the Federal Republic of Germany, for making exaggerated use of publicity (474). Despite these drawbacks, however, correspondence instruction is given preference over evening classes in Eastern Germany, and all countries seem to agree that it will have an increasingly important role to play in national educational systems and institutions. As indicated in the Swedish survey, correspondence study will continue to fulfil its traditional purpose of providing a means of further education; it permits greater individualisation of instruction—students can proceed according to their own abilities and interests and at their own pace; it can help offset the chronic shortage of teachers and can give the teachers themselves an opportunity to update and widen their knowledge; it could be a means of bringing skills and greater occupational independence to the physically handicapped or otherwise disadvantaged (475).

But correspondence training needs to be given a "new look". Greater attention must be paid to the work of preparing and directing the courses, and to giving the students adequate follow-up services, as is shown in abstracted articles from the USSR (479, 480, 482), the Federal Republic of Germany (483) and the USA (484). Drafting a correspondence course is work for specialists. Since studying by correspondence is a voluntary activity, says the American abstract, the course must itself provide the motivation or stimulus for doing the lessons and exercises. The latter should be frequent but must avoid being either frustratingly difficult or irritatingly simple. Tests, it goes on to say, are the chief channel of communication between student and teacher: they must inform both about progress made.

It is the lack of personal contact which is the most severely criticised, however. The remedy most frequently proposed, as shown in abstracts on Sweden (475), France (478) and the United Kingdom (485), is to combine correspondence courses with other teaching media—television, radio, programmed instruction—or to organise sessions during which lessons are "heard" at the student's place of work.

Audio-visual techniques

A great deal has been written about the visual and audio-visual methods of training and the teaching aids today available as support for the teacher and instructor. As with programmed instruction, teaching machines and correspondence courses, exaggerated claims are sometimes laid to their door. Most of the references stress their subordination to the teacher: audio-visual aids must remain what they are—devices to assist the instructor, not replace him. They are part of the teacher's stock in trade for achieving higher efficiency through increased realism in his instruction.

Obviously, much hope is placed on television as an educational medium of the future. This is borne out by the number of abstracts describing the functioning and uses of different types of instructional television programme in vocational schools, technical colleges and industry—in the United Kingdom (486, 487), Belgium (488), the Federal Republic of Germany (489), France (490) and the USA (491), and in training agricultural workers in Eastern Germany (492) and in France (493), to mention a few. A Belgian study (494), based in part on a UNESCO report published in 1961, indicates five methods of utilising television in education:

> "(1) fully televised instruction – the teacher supervises;
> "(2) televised instruction + direct teaching or correspondence instruction (formula currently in use in Belgium for school television);
> "(3) direct teaching + supplementary televised instruction from time to time;
> "(4) television apparatus employed by the teacher as an audio-visual aid;
> "(5) television used for training the teachers and improving teaching methods."

In this abstract and in others, a central theme is the impact of television on the classroom teacher (487, 489, 491) and its implications for teacher training. In Eastern Germany the Vocational Training Institute's Working Party on Television and Adult Education asserted that, contrary to prevailing beliefs and fears, instructional television has enhanced the teaching profession and gives teachers important new tasks (495). It is clear that educational television is a valuable adjunct to teaching, but its over-all role and importance are still being studied. Its full development as a legitimate arm of education and training will be a question of time for testing and the availability of the funds needed to make widespread adoption possible.

In developing countries, the prospects for its application are excellent and it may in fact be one of the most effective ways of solving the problems of mass education faced by most of the countries concerned. A survey carried out by the Oversea Visual Aids Centre (OVAC) recommended extensive use of radio and television to reinforce the printed word, but has warned against practical problems such as effective transmission, supply and servicing, as well as, of course, cost (496).

Telescript

An interesting experiment reported from Canada describes the problems of technical personnel in remote locations and points out that the applicability of their knowledge decreases by 50% in five years unless they can keep up with developments in their field. It goes on to describe a fascinating new aid to education: VERB—the Visual Electronic Remote Blackboard. Basically it is a telescript and telephone system which allows a teacher to have two-way communication with a number of remote areas both visually (via the blackboard) and verbally. Telescript provides instantaneous transmission of hand-written messages or sketches over the regular telephone network.

With VERB, the telescript unit at the receiving end is equipped to project the message or sketch on to a screen for group viewing. A second long-distance line is used for voice communication. The system permits linking several classrooms in the same building or even in different cities. The teacher can receive immediately the students' questions and observations, again by telephone; his own remarks are transmitted by loudspeaker so that all the classes can participate simultaneously in the discussion (497). A somewhat similar system, but without the tele-script possibilities—the dial-access system—is described in an abstract on current instructional media research in the USA (498).

Films and tapes as instructing aids

Films and slides have come in for relatively little comment in the abstracts—their "novelty period" was already over before publication of the abstracts started. An example of films used in the USSR to test technical school students on their assimilation of safety factors in a metalworking shop, or of railway signals (499), and an article on a system using films to train key-punch operators in the USA (500) can be mentioned as examples of new applications of techniques which have already gained acceptance. Of more interest as new developments in audio-visual instructional media are items on the overhead projector, on sound slides and on the use of tape recordings (both audio-tapes and video-tapes) for industrial and commercial training and in programmed instruction (453, 501-506).

Visual and audio-visual media and techniques have entered a new, assessment phase, with an increasing number of studies and manuals on their uses and operation being produced. Audio-visual methodology is being evolved. The study by the Oversea Visual Aids Centre is a case in point, as are the OECD catalogue of technical and scientific films (507), and a "Manual of visual presentation in education and training" published in the United Kingdom (508). No attempt has been made in the abstracts to seek out and include such references systematically. The titles and examples which have been noted can only be viewed as symptomatic of a general desire to assess the uses and abuses of such media, to apply a benefit-cost approach before embarking on wholesale distribution and application.

Realism for greater effectiveness

Much of the experimenting with these and other aids can be traced to a desire to inject new realism into training—to bring the workshop into the schoolroom. There is a growing range of complex training apparatus and a more frequent recourse to simulation techniques for initiating the worker into production or goods handling processes which are difficult to isolate or interrupt for training purposes. Mock-ups, cut-away and other three-dimensional models are sometimes the answer—for demonstrating different types of driving gear (509, 510), for bringing the foundry into the school laboratory (511), or to prepare unskilled steel workers for handling the heavy equipment used in the production departments and ancillary services of a steel mill (512).

Simulation techniques are proving particularly effective in training programmes in the chemical industries and oil refining (513), both continuous production industries presenting special training problems. In some cases simulation techniques are carried over into business and commerce. Role-playing in "fictitious firms" has been well-known for some time as a training technique in the Federal Republic of Germany (514), as was described in an article in an earlier issue of "Training for Progress" (Vol. 2, No. 4, 1962). The idea has recently been adopted by a major bank chain in the United Kingdom which has established a model bank as a training centre where the "trainees" can see and perform in turn all types of banking transaction (515).

There seems to be a concerted effort towards greater use of project work and other active methods to stimulate the learning power of the trainees, whether adolescents or adults. It is part of the experimental approach to the whole field of training methods, the attempts to find the answers to certain basic questions.

When and how, for instance, should the new recruit be exposed to the conditions and pressures of production? The production training organised for young technical school trainees and pupils in the senior years of common basic school in the USSR (458, 516-518) and in Eastern Germany (519) is only one of the methods reported and discussed in the abstracts. The plant and workshop visits discussed in Chapter III represent another. Should the young miner in the United Kingdom go all through the slow process of training on traditional tools and equipment, which in all likelihood he will hardly ever use, in order to acquire a "pit sense", or can he be trained at once for work on a mechanised coal face (520)? Concern with this same problem is to be seen in an abstract on special techniques used in a mining school in Upper Silesia (Poland) to give students and apprentice miners a true picture of the working of a mine before ever they go underground (521). How can experimentation and pilot project development be worked into vocational/agricultural training (522)? How can business take account of the psychological aspects of training, such as motivation and attitudes towards learning (523)? How can lessons in handling computers and other complex and expensive business machines be given realism and purpose without incurring an interruption of the operational schedule (524, 525)? When, where and how should trainees be taught the principles and techniques of continuous repair in chemical plants (526), or machine maintenance in the metal and mechanical trades (527)?

Adult education and training

These are questions which are vital to all levels and types of training. The answers are likely to be different according to local situations and immediate training objectives. On the whole, the actual techniques differ little. The adult worker being retrained for a new type of employment is likely to derive just as much or even more benefit from the use of more active teaching methods as is the adolescent being trained for his first job. Adult education nevertheless does deserve special mention, especially in relation to the problems encountered in training older workers and the methods used for solving them.

The social and economic aspects of the problem of retraining the older worker have already been discussed. Translated into practical action they become dominated by psychological and physiological considerations. Personnel officers and training specialists tend to agree, as stated in an abstract on the United Kingdom (528), that the older worker undergoing training is handicapped by four main psychological problems:

"—difficulty in maintaining pace of work;
"—deterioration of short-term memory;
"—disinclination to reverse decisions;
"—fear of failure and consequent humiliation."

The same article concluded that these difficulties could be overcome by arranging long, uninterrupted periods of learning, allowing the trainee to set his own learning pace, providing written instructions and notes to which he can refer, encouraging him to take notes, using active rather than passive teaching methods, introducing an element of self-testing to stimulate the assimilation of new knowledge. To these methods principles an abstract from the USA adds the need to avoid having the older trainee isolated in a group of younger ones and to reassure him that retraining is a means of retaining —or regaining—his status (529). A Canadian abstract points out that the older trainee is likely to experience difficulty if put on a course which has been geared specifically to younger people with recent classroom experience (530). The training should, in addition, make as much use as possible of his previous experience. From all three countries, as well as others, the abstracts have drawn excellent examples of training programmes organised for the older worker. The cliché about not being able to teach old dogs new tricks seems to have been abandoned, but the educationists pay due respect to the problem of unlearning old responses, which still remains. A parallel might be drawn here between this requirement and the experimental supervisory training programme in Canada, mentioned in Chapter IV, which used behaviouristic methods for "unfreezing" attitudes to increase receptivity, introducing new attitudes in short intensive courses and "refreezing" and reinforcing them through practical application (308).

Methods research

The demand for evaluation of training frequently becomes translated into attempts to compare the relative effectiveness of different methods of training and training media. The Swedish Institute for Research on Work Study Techniques (ASTI), for instance, carried out a 12-month research project during 1960-1961 to assess the effect on learning speed of four different methods used to instruct qualified workers to carry out new, repetitive operations: brief oral instruction, written instruction with sketch and key points, detailed oral instruction with follow-up supervision, and taperecorded instruction (531). The Stanford Research Institute (California, USA) carried out a somewhat similar project to test the effectiveness of three types of instruction for training journeymen electricians: auto-instruction with a branching type of electrically operated teaching machine with built-in weekly review tests; auto-instruction accompanied by live discussion with an experienced instructor (to replace the review tests); conventional classroom instruction (532). There are also all the research and evaluation projects on programmed instruction, already discussed above, as well as the trials with combinations of different methods and training media.

In France, on a slightly different plane, an attempt was made in 1965 to assess the effectiveness of the training for building trades workers in public technical secondary schools providing full-time instruction, in full-time courses at public vocational schools, in other full-time schools and in trade apprenticeships with part-time related instruction, by comparing the number of passes achieved by each group in the relevant CAP trade certificate and final apprenticeship (EFAA) examinations. The apprenticeship group was divided into two sub-groups: those who had followed the traditional type of related instruction and those who had taken correspondence courses. The results, on the face of it overwhelmingly in favour of the full-time training in schools, perhaps reflect more the imbalance between the general education and trade training given the apprentices—and the weight given to academic subjects in the tests—than the differences in the actual skill levels attained by the candidates (533).

Methods research is in fact gaining in importance all along the line—an outgrowth of the pressures which have given rise to the drive for rationalisation, realism and greater effectiveness in training. This spirit of experimentation and research has been seen throughout this chapter. It can also be seen in the resolution adopted by the colloquium on questions raised by modern teaching methods and programmed instruction, organised in June-July 1963 by the European Educational Centre and the Italian National UNESCO Committee in co-operation with the Bureau of Research and Planning of the Italian Ministry of Public Education (534). It is evident in the work of the Warsaw Pedagogical Institute on the testing of the effectiveness of didactic methods in vocational/technical instruction in technical secondary schools and colleges (535), and in the Belgian government's decision (September 1963) to set up and give official status to the International Association for Encouraging the Use of Modern Teaching Techniques (536).

Special methodology problems in the developing countries

There is also, in many countries, a conscious effort to assess the effectiveness of methods and media for conveying skills and knowledge to the millions of persons clamouring for education and training in the less economically and educationally advanced regions of the world. The problems inherent in introducing any of the methods discussed above are complicated in these countries by the additional problems of massive rates of illiteracy, or near illiteracy, the absence of a "technical background" and consequently the need to teach concepts which in other countries and regions are absorbed naturally from mere contact with machines, electricity, etc. And to these should be added the problem of cost: many of the methods and media which would be most suitable are those which are both too highly technical and too expensive for their general application to be feasible (496).

A not inconsiderable problem, too, is the question of the language of instruction. As pointed out in one abstract: "the technical and scientific vocabularies of the vernacular language [of Africa] are not yet sufficiently developed for use in giving technical and scientific instruction. Moreover, the majority of African countries still require a large number of foreign teachers and these cannot work in the vernacular. For the time being, it will therefore be necessary to provide such instruction in the European language best known in the country". The text goes on to deplore a situation which virtually requires all instruction to be given in a foreign language. At the end of primary school the children have not learnt the language well enough to grasp what is being taught, nor have they acquired a sufficiently high standard in the other subjects. All instruction, it is felt, should initially be in the vernacular, which should continue to be used throughout primary school. Once the pupils start to learn the foreign language, the vernacular should continue to be used for purposes of explanation and clarification. Instruction in primary schools preparing their pupils for immediate entry into working life (in rural areas, for example) should use the vernacular exclusively (537). But this raises yet another problem: the scarcity or sometimes even complete lack of textbooks and other instructional material written in that language.

Another abstract, discussing the language barrier problem in India and in south-east Asia generally, affirms that it is more particularly the lower grades of technical/industrial worker which have most to gain from a sustained effort to prepare and use widely textbooks written in the local language: at the higher levels of training the problem of teaching foreign languages remains. It goes on to suggest a need for research into the effects of communication failures—for lack of language competence—on factory output, since "a close examination of language factors in communication within industrial undertakings in Asia would undoubtedly reveal that failures in this area are costing large sums of money. Definition of areas of difficulty would allow countermeasures to be taken" (538).

A study on providing vocational training for illiterates and semi-illiterates in French-speaking Africa (539) points out other basic problems: the difficulty encountered by such people in transferring the image in a picture or drawing to the object it represents, and their general lack of comprehension of the concepts of time and measurement, and consequently their inability to grasp the idea of productivity. A method of combining literacy programmes with vocational training, successfully practised in training miners in Morocco and petroleum industry workers in Algeria, has been derived from the application of three principles:

- the need for a close link between the instruction and the environment of the trainee;
- the need to associate the acquisition of language skills and the interpretation of drawings and pictures with instruction in general and technical education subjects;
- the desirability of having the instruction given by teachers and instructors drawn from the same background as the trainees but having a level of education only slightly higher than their own.

But—as already emphasised in the editorial at the beginning of this issue—methods research specifically directed towards solving the many problems encountered in attempts to raise the level of technical knowledge and understanding of the largely illiterate masses of the developing countries is an area which on the whole is still relatively unexplored.

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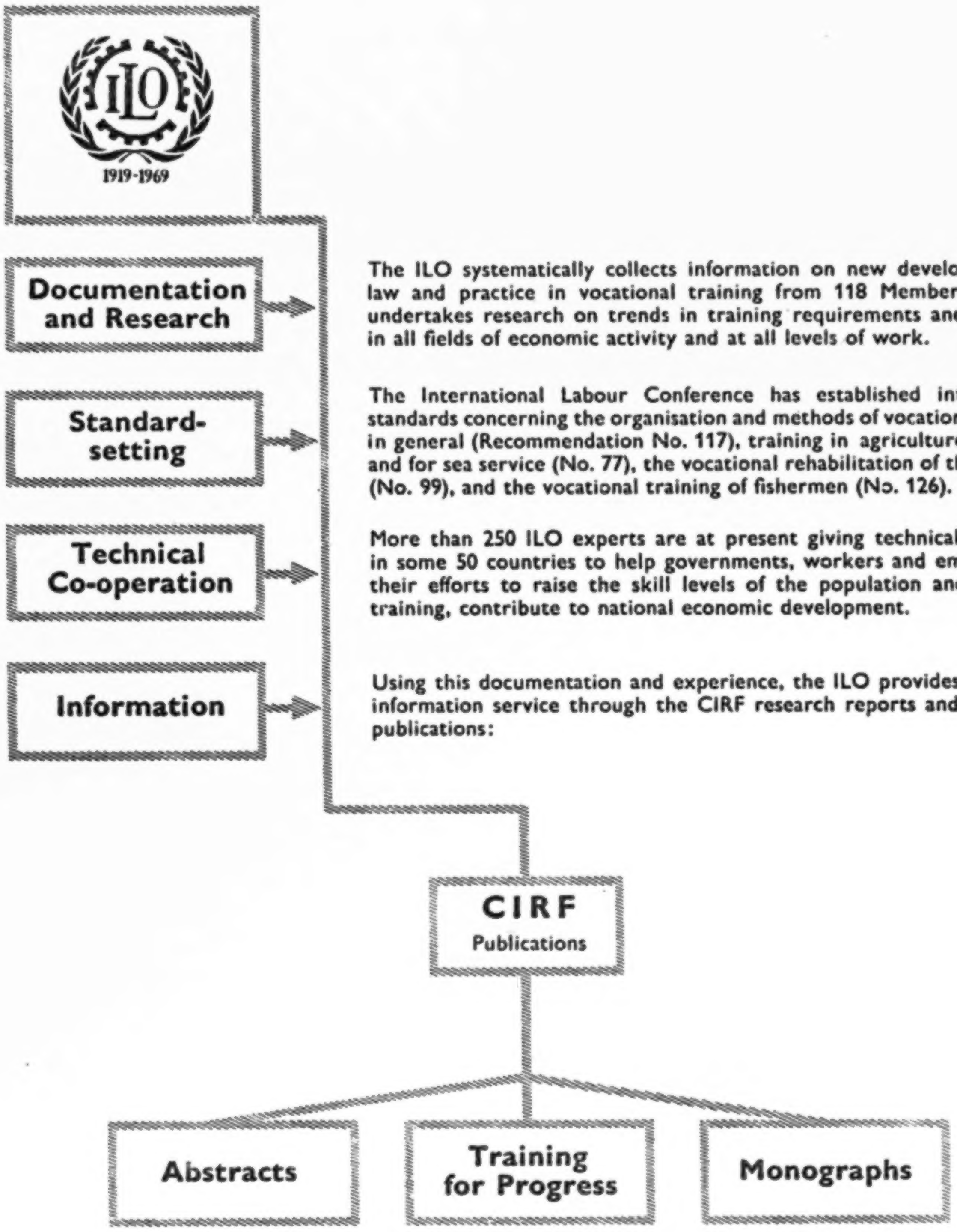
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